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V2010 Security Planning and Operations A Social Network Study of Key Information Sharing Relationships

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Abstract

Ensuring adequate security for a major event, such as the 2010 Olympic and Paralympic Winter Games, is a significant, multi-year effort involving numerous federal, provincial, regional and municipal government partners, as well as a vast web of public, private and international stakeholders. The current study was undertaken to provide a Social Network Analysis of the flow of information (between interagency partners) on security-related issues prior to and during the Olympic Games. A chief goal of those mostly senior level officials involved in Olympic security planning was to acquire and convey information in order that sound decisions could be made. By measuring the structure of formal and informal relationships between interagency partners (e.g., who shared information with whom), this study assessed how well the leadership group was effectively collaborating to make decisions. Findings indicated prevalent attitudes favouring interpersonal, even inter-organizational, working relationships among the mostly senior-level officials involved. That is not to say that everyone occupied similar roles in the network with respect to information sharing, however. This paper introduces a typology of nodes based on the roles some officials were thought to exhibit (e.g., transmitters, information sinks, expert brokers, and periphery). Examples include those who were on the receiving end of information, but neglected to utilize personal relationships to pass along the information they received. Others were faced with the need to continually make partners aware of the important role they had to play. Whilst others still were key brokers of information and intermediaries who linked communities together. This paper also conveys the benefits to greater horizontality within the federal government where there are coordinating bodies, such as the Office of the Coordinator for 2010 Olympic and G8 Security.

Résumé

Veiller à la sécurité d'un événement majeur comme les Jeux olympiques et paralympiques est une tâche colossale répartie sur plusieurs années qui nécessite la participation de nombreux partenaires des gouvernements fédéral, provinciaux, régionaux et municipaux ainsi qu'un vaste réseau d'intervenants à l'échelle publique, privée et internationale. La présente étude a été entreprise dans le but d'analyser les réseaux sociaux par lesquels l'information a circulé (entre les partenaires des divers organismes) avant et pendant les Jeux olympiques. L'un des principaux objectifs des fonctionnaires affectés à la planification de la sécurité des Jeux, qui appartenaient majoritairement aux échelons supérieurs, était d'obtenir et de transmettre l'information pour favoriser la prise de décisions éclairées. En observant la structure des relations formelles et informelles entre les partenaires des divers organismes (p. ex. qui partageait de l'information avec qui), l'étude a permis d'évaluer dans quelle mesure le groupe dirigeant collaborait dans le cadre du processus décisionnel. Selon les constatations de l'étude, il existe une tendance privilégiant les relations de travail interpersonnelles et même interorganisationnelles entre les fonctionnaires concernés. On n'en conclut toutefois pas que tous jouent des rôles similaires au sein du réseau de partage de l'information.

Le présent document fait état d'une typologie des nœuds d'information reposant sur les rôles que l'on pourrait associer à certains fonctionnaires (p. ex. transmetteur, collecteur d'information, expert du courtage d'information et acteur périphérique). On a notamment constaté que certains récepteurs d'information négligeaient d'utiliser leurs relations personnelles pour transmettre l'information reçue, tandis que d'autres devaient constamment rappeler aux partenaires l'importance de leur rôle. D'autres encore agissaient comme courtiers clés en matière de partage d'information et établissaient le lien entre les communautés. Enfin, cette étude démontre les avantages du renforcement de la communication horizontale au sein du gouvernement fédéral, surtout en présence d'organismes de coordination, comme le Bureau du coordonnateur de la sécurité (BCS) des Olympiques de 2010 et du G8.

Executive summary

V2010 Security Planning and Operations: A Social Network Study of Key Information Sharing Relationships

Sean Norton; DRDC CSS TR 2011-04; Defence R&D Canada – CSS; February 2011.

Introduction or background:

Ensuring adequate security for a major event, such as the 2010 Olympic and Paralympic Winter Games, is a significant, multi-year effort involving numerous federal, provincial, regional and municipal government partners, as well as a vast web of public, private and international stakeholders. While the Royal Canadian Mounted Police (RCMP) had the operational and tactical lead for security planning and operations, a separate Deputy Minister level secretariat, referred to as the Office of the Coordinator for 2010 Olympic and G8 Security (OCS), was established and housed within the Privy Council Office (PCO) to coordinate the “whole-of-government” preparations. Before the OCS was disbanded, the Coordinator asked Defence R&D Canada (DRDC) to undertake an After Event Review (AER) process to identify critical issues associated with federal, interagency coordination generally, as well as involvement in future major event security planning specifically. A multi-method research study was subsequently undertaken by DRDC. This report provides a technical analysis and discussion of one component of the review, which involved Social Network Analysis (SNA) for diagnostic purposes to assess the flow of information (between interagency partners) on security-related issues prior to and during the Olympic Games. A chief goal of those mostly senior level officials involved in Olympic security planning was to acquire and convey information in order that sound decisions could be made. By measuring the structure of formal and informal relationships between interagency partners (e.g., who shared information with whom), the SNA study assessed how well the leadership group was effectively sharing information as a basis for the security-related decisions that were made.

Results:

Who a person knows tends to be a critical factor affecting the information they obtain and the manner in which problems are solved or decisions are made. Also, while information flows in a hierarchy, it will also flow to the same or a greater degree through a vast web of informal channels. Social network analysis provides a structured means to assess the positional status of mostly senior-level officials in the network of information-sharing relationships.

There were prevalent attitudes favouring interpersonal, even inter-organizational, working relationships among the mostly senior-level officials involved in Olympic security planning and operations who were involved in this study. Despite there being notable exceptions, the vast majority believed that developing and leveraging personal relationships was of critical importance to the successful planning and operations of the Games. That is not to say that everyone had the same role in cultivating interpersonal relationships. The role that different people and organizations occupied differed. Of those who occupied positions with respect to security preparations, some were fairly to highly central in the network, whereas, others were peripheral. A rational conclusion of the study is that there is a need to ensure that the right people and skill sets are sought when undertaking “whole of government” activities in so far as not all individuals

are ideally suited to the task. There were instances where certain individuals who had difficulty getting along or were reluctant to cooperate or share information with others had to be replaced.

There were several roles that officials appeared to occupy that were examined in this report. One of the roles was that of a “receiver” or “information sink.” Most managers are probably “receivers” in so far as their subordinates, the persons from whom they receive information, are likely to be more numerous than their superiors, the persons to whom such information is relayed. However, when the analysis was triangulated with interview data, a few managers were clearly “information sinks,” having received information from numerous sources via informal channels while at the same time having utilized those channels to cultivate relationships with only very few others as a basis for passing along the information that they had received. Of those who were identified as falling within this category, one openly rebuked the need to cultivate personal relationships, preferring instead to rely on formal structures and positions for sharing information.

Another role was a “transmitter” of information. Such persons are likely to be subject matter experts. They are the ones with specialized knowledge and expertise that is shared irrespective of whether they are also the receivers of information flows. Non-traditional security partners, such as Public Health Agency of Canada (PHAC), fell into the category of having to continually make more traditional security partners aware that most security events create concerns for people’s health.

A small subset of “transmitters” were regarded as being “super transmitters,” having identified a much greater than average number of others with whom they elected to share information. Generally speaking, scientists were among those who fell within this category, being non-traditional partners who arguably, have an increasingly important interagency role to play. Though, if people are unaware of them, they won’t be able to connect with them. Moreover, the extent to which they will be seen to be key contacts, largely depends on their ability to educate clients about their skills and expertise and how best to interpret and make use of their tools and capabilities. Scientists also need a certain amount of training and sophistication for dealing with operational clients who often need to be educated on how best to make use of science products.

Other officials were seen to occupy the exceptional role of being “expert brokers” of information. These are the persons who really stood out amongst the rest. They were believed to value horizontality in so far as they were nominated by a much higher than average number of actors and were themselves nominated by a much higher than average number of others. Of the top five in this category, three were from the OCS, and one was from Integrated Public Safety (IPS). Clearly, the staff within the OCS had a large “rolodex” to draw upon, as well as credibility with several different government departments and agencies. Since the OCS lacked direct control over any other individuals or departments/agencies, “it all came down to personal relationships”.

The “expert brokers” from the OCS relied on their own personal networks for doing their work, but these were also leveraged to facilitate inter-agency decision-making at higher levels. Brokers also acted as “pathfinders” by helping people from other organizations to find appropriate interagency contacts. Having “inroads” into organizations, such as the RCMP, meant that the OCS could also act as key intermediaries by facilitating the development of new relationships.

Where some officials were highly central, others were on the “periphery” of the network. An actor was considered peripheral if they nominated and were nominated by significantly fewer actors than others. About 12% of study participants fell into this category. Reasons as to why individuals or organizations are peripheral are several. It may be that others are not aware of a person’s knowledge or expertise, whereas, others are simply inaccessible. Organizations whose mandate is not well understood can also place them on the periphery. Being on the periphery is

not always a negative thing. Not everyone needs to have a central role, as is the case with some *transmitters* who have highly specialized knowledge or skills. Others have important, albeit minor roles and simply feed in where necessary. Being on the periphery is a concern, however, when it limits one's ability to learn of the ways in which they should be involved. Being on the periphery can severely limit what people come to know, in terms of the information they obtain, hence their ability to do your work. It is also problematic when people's knowledge and skills are not being utilized because they are not known to others. In the case of the latter, ways to integrate those people with specialized knowledge and skills warrants consideration when undertaking interagency activities in order to ensure that they are being fully utilized by relevant others.

There are times when a person is peripheral in terms of their number of connections to others, but are still central by virtue of the quality (vice quantity) of their relationships. Being connected to persons who are themselves quite central can increase the likelihood that actors will become privy to information that is passing through a network by virtue of how central are their key contacts.

Having greater as opposed to fewer relationships can be advantageous where as a result, individuals are believed to have greater access to the information that flows through a network. Positions can also be favourable if actors are connected to other central players in the network who are themselves well connected. Another measure of centrality involves the extent to which persons in the network were key intermediaries, mediators or brokers.

Someone is said to have positional advantage if they reside "between" a number of others in the network. Having a high degree of "betweenness" can represent a form of power in a network if network actors must depend on them as intermediaries to broker connections. When key intermediaries function well, they serve as a vital "bridge" connecting otherwise disconnected individuals or groups. By the same token, reluctant intermediaries can obstruct information flows, hindering interagency efforts. The OCS staff ranked among the top ten in terms of betweenness centrality.

When assessing the ability of any one actor in the network to reach anyone else, it was found that a significant minority could reach everyone within four degrees of separation. While this seems to denote a high degree of reachability, it is not very practical for a senior official to contact the colleague, of a colleague, of a colleague, of a colleague, in order to reach someone for purposes of acquiring information or to leverage their skills and expertise. People are more likely to call the "friend of a friend." Being highly central, four out of the five OCS staff could reach or could be reached by a majority of the others in the network of participants based on, at most, one referral.

The value of the OCS as a coordinating body was further demonstrated by the degree of fragmentation that occurred after removing them from the network. Thirty-three individuals, representing 7.2% of the network, were disconnected following the removal of the OCS. The staff from the OCS were the only individuals in the network who identified key contacts within the U.S. Embassy, Public Works and Government Services Canada (PWGSC), and Natural Resources Canada (NRCan). They were also a main conduit to the National Security Advisor in the PCO. Also, without the OCS, non-traditional partners (e.g., Citizenship and Immigration Canada (CIC), NRCan) were isolated from the security community.

Much of the analysis involved person-to-person information sharing relationships between mostly public sector officials involved in safety and security planning and operations. The fact these persons were nested within organizations meant that a separate organization-to-organization analysis could also be undertaken based on the organizational affiliation of each individual. Centrality measures were then calculated for an organizational network in a manner similar to

that undertaken with the person-to-person relations. According to the results, the OCS ranked first by far in terms of their number of incoming connections. The Integrated Security Unit (ISU) ranked second, followed by the Vancouver Organizing Committee for the 2010 Olympic and Paralympics Winter Games (VANOC), the RCMP (not including E-Division, which was captured separately), the Province and Public Safety Canada (PS)¹. While this analysis focused on the relative standing of organizations based on their number of incoming ties, it is worth noting that the IPS and PHAC ranked somewhat higher in terms of their number of outgoing than incoming connections. In interviews, a PHAC official spoke of the need to continually educate others about the important implications of security related matters for public health. IPS appeared to face a similar situation concerning the importance of public safety.

Weighting the links between organizations provided another means of assessing the strength of the information sharing relationship that existed during Olympic planning and operations. Those relationships that appeared to have the greatest interaction were, first and foremost, between the ISU and IPS, then the ISU and RCMP headquarters, followed RCMP headquarters and the OCS. While one might infer that the ISU and IPS had a much stronger relationship, overall, than that between most other organizations, further analysis revealed that the relationship was uneven. The IPS identified a much greater number of people in the ISU than did the ISU of the IPS.

A more rigorous approach to understanding the connections that existed between organizations involved an analysis of “cliques”. The definition of a “clique” involves the maximum number of actors who have all possible ties present among themselves. The analysis revealed 19 maximal complete sub-graphs based on the requirement that all possible ties be present among the entities who made up the clique. Remarkably, the OCS was a member of all 19 cliques. The ISU was a member of eight cliques (42.1%), whereas, the next most involved organization was PS (not including the Government Operations Centre or National Exercise Division, which were captured separately), which was involved in five of the 19 cliques (26.3%).

Looking at how many cliques the different organizations shared membership in one can see that the OCS and ISU were the closest organizations on the basis of them sharing membership in eight of the 19 cliques (42.1%). Despite IPS staff being co-located with the ISU, for example, the two organizations shared membership in only 3 cliques (15.8%). The OCS was also the only organization to share a clique with Health Canada and PHAC.

Looking at a hierarchical clustering of cliques based on the extent to which they overlap with one another (i.e. have the most number of members in common), one can see that the OCS and ISU had the closest relationship of all the organizations, followed by the OCS, ISU and Canada Command (within the Department of National Defence and the Canadian Forces (DND/CF)), then the OCS, ISU, Canada Command and the IPS. Somewhat separate from these were close relationships between RCMP Headquarters (HQ) and PS, followed by RCMP HQ, PS and Canadian Security Intelligence Service (CSIS).

Even though this research project was initiated to examine the “whole of government” approach to security planning and operations for the Games, during interviews, it became apparent that public safety and security were inextricably linked. While there was tremendous emphasis placed on preventing or mitigating threats to the Games, many regarded the ability to manage the response and recovery had a significant consequence management crisis occurred to be equally

¹ While the Government Operations Centre (GOC) and National Exercise Division (NED) are apart of Public Safety Canada, these entities were identified separately in the social network analysis.

important. Several interviewees, particularly those from public safety organizations, expressed concern that too little attention was paid to consequence management vis-à-vis Olympic security.

Given the purpose of this study, it is not surprising that a majority of interviewees were primarily focused on security (52%), as compared to public safety (22.7%) or the Games (7.9%). After classifying actors based on their function (i.e., safety, security or the games), one can observe what are essentially two separate communities – those oriented towards either safety or security. There are two identifiable clusters containing a large segment of both communities. Key intermediaries served to broker connections within and between the safety and security segments. Judging by the placement of the OCS nodes, they were central within the security segment, but were also vital in bridging together the security and safety communities. A few other actors from the two communities also acted as important intermediaries linking the communities together.

As the secretariat responsible for coordinating security, the OCS, was widely viewed as having accomplished precisely what was needed for a “whole of government” activity, the sheer scale and complexity of which, was unlike anything that Canada had dealt with before. The OCS ranked the highest in terms of their overall centrality in the network. It had the most number of connections to other organizational entities and sub-entities, was connected to other entities who were also quite central in the network. By facilitating, negotiating, mediating, and advocating, its members also became key intermediaries or “boundary spanners,” operating at the nexus between a number of organizational entities. They provided the vital bridge to the regular Deputy Minister working groups, including the DM Security Advisory Committee (DM SAC), as well as several ad hoc committees, the Province, and Treasury Board Secretariat (TBS).

After reviewing the findings from the SNA, one can readily see the benefits to horizontality within the federal government where there are structures in place to coordinate “whole of government” activities. Following the Olympics, there appears to be greater appreciation and acceptance regarding the need for horizontal approaches to planning within the federal government. One senior official believes that the public sector is already much more “horizontal” around specific initiatives than the private sector. Even so, according to him, the exercises (e.g. Bronze, Silver and Gold), in particular, created the impetus for much greater horizontality between departments and agencies. It begs the question of whether the degree of interconnectedness in the network denotes a shift towards greater cooperation and collaboration in the public sector to address problems associated with an increasingly complex social and political landscape. The extent to which a coordinating body is necessary and useful for facilitating horizontality on a day-to-day basis warrants scrutiny in other context.

Significance:

A key implication of the findings is the value of a coordinating body when undertaking security preparations for “whole of government” events that pose significant challenges in terms of their size, length of time, number of departments, Federal-Provincial and/or international connections. The OCS was widely seen as vital to the success of V2010 security planning and operations. Despite how central the OCS was and the fact most viewed it to be instrumental to security preparations, the decision to create a separate secretariat for security was not readily apparent.

While the circumstances that led to the creation of the OCS were unusual for a number of reasons, when and under what circumstances similar types of coordinating structures should be created in the future warrants consideration in another context. After reviewing these findings, it is hard to deny the benefits to horizontality within the federal government where there are

structures in place to coordinate “whole of government” activities. Following the Olympics, there seems to be a much greater appreciation and acceptance for horizontal planning efforts. The Olympics was certainly effective for strengthening interpersonal relationships across government. The exercises and working groups, in particular, were integral for fomenting trust relationships.

With the Olympics having come and gone, however, it is not clear how long close working relationships can be maintained, particularly where officials shift positions. Significant efforts must be extended to continually renew interpersonal and interagency relationships. While the benefits of having a coordinating body were apparent for managing whole of government security preparations for an unusual event, such as the Olympics, it may be that the many of the benefits referred to herein provide a rational basis for establishing similar structures on a more usual basis.

Sommaire

Plans et opérations de sécurité pour V2010 : Étude des relations clés de partage d'information au sein des réseaux sociaux

Sean Norton; DRDC CSS TR 2011-04 CSS – R & D pour la défense Canada; février 2011.

Introduction ou contexte :

Veiller à la sécurité d'un événement majeur comme les Jeux olympiques et paralympiques est une tâche colossale répartie sur plusieurs années qui nécessite la participation de nombreux partenaires des gouvernements fédéral, provinciaux, régionaux et municipaux ainsi qu'un vaste réseau d'intervenants à l'échelle publique, privée et internationale. Alors que la Gendarmerie royale du Canada (GRC) était responsable du volet opérationnel et tactique de la planification et des activités relatives à la sécurité, on a établi un secrétariat distinct à l'échelon des sous-ministres, soit le Bureau du coordonnateur de la sécurité (BCS) des Olympiques de 2010 et du G8, pour coordonner la préparation pangouvernementale depuis le Bureau du Conseil privé (BCP). Avant la dissolution du BCS, le coordonnateur a demandé à R & D pour la défense Canada (RDDC) de mener un processus d'examen après événement (EAE) pour déterminer les enjeux critiques liés à la coordination fédérale et interorganisme au sens large ainsi qu'à la participation au processus de planification de la sécurité en vue d'événements majeurs futurs. RDDC a par la suite entrepris une étude de recherche faisant appel à des méthodes multiples. Le présent rapport fait état d'une analyse technique ainsi que d'une discussion sur l'une des composantes de l'examen, soit l'analyse des réseaux sociaux (ARS) pour des motifs diagnostiques visant à évaluer la circulation de l'information (entre les partenaires de divers organismes) relative aux questions de sécurité avant et pendant les Jeux olympiques. L'un des principaux objectifs des fonctionnaires affectés à la planification de la sécurité des Jeux, qui appartenaient majoritairement aux échelons supérieurs, était d'obtenir et de transmettre l'information pour favoriser la prise de décisions éclairées. En observant la structure des relations formelles et informelles entre les partenaires des divers organismes (p. ex. qui partageait de l'information avec qui), l'ARS a permis d'évaluer dans quelle mesure le groupe dirigeant collaborait dans le cadre du processus décisionnel.

Résultats :

Le réseau de personnes-ressources de quelqu'un semble être un facteur déterminant quant à l'information que cette personne obtient et à la manière dont les problèmes sont résolus ou dont les décisions sont prises. De plus, alors que l'information circule entre les échelons hiérarchiques, elle circule autant sinon plus au sein d'un vaste réseau de communication informel. L'analyse des réseaux sociaux constitue un moyen structuré d'évaluer où se situaient les fonctionnaires, qui appartenaient majoritairement aux échelons supérieurs, dans l'amalgame des relations de partage de l'information.

Il existait une tendance privilégiant les relations de travail interpersonnelles et même interorganisationnelles entre les fonctionnaires qui ont participé à la planification de la sécurité et du déroulement des Jeux olympiques et qui ont fait l'objet de la présente étude. Malgré des exceptions non négligeables, la grande majorité de ces fonctionnaires estimaient que l'établissement et l'utilisation de relations personnelles étaient essentiels à la réussite de la

planification opérationnelle des Jeux. Mais tous n'avaient pas pour autant le même rôle sur le plan de l'entretien des relations interpersonnelles. En effet, les gens et les organismes agissaient de façon distincte. Par exemple, chez ceux qui occupaient des postes liés à la préparation de la sécurité, certains jouaient un rôle plus ou moins central dans le réseau tandis que d'autres étaient des acteurs périphériques. L'une des conclusions logiques de l'étude met en relief la nécessité de s'assurer que les personnes choisies ont les compétences et le profil requis quand vient le temps d'entreprendre des activités pangouvernementales, car tout le monde n'est pas le candidat idéal pour accomplir la tâche. Il a même fallu remplacer certaines personnes qui s'entendaient difficilement avec les autres ou qui étaient réticentes à coopérer ou à partager de l'information.

Plusieurs rôles joués par les fonctionnaires ont fait l'objet de l'étude, notamment celui de « récepteur » ou de « collecteur d'information ». La plupart des gestionnaires sont susceptibles de jouer le rôle de « récepteur » étant donné que leurs subordonnés, soit les personnes de qui ils obtiennent de l'information, sont généralement plus nombreux que leurs supérieurs, soit les personnes à qui ils transmettent l'information. Toutefois, la validation de l'analyse en fonction de données d'entrevue a permis de constater que quelques gestionnaires ont été de véritables « collecteurs d'information ». Ces derniers recevaient de l'information de nombreuses sources par l'entremise de voies informelles et utilisaient ces voies pour entretenir des relations avec quelques rares autres personnes, tout en transmettant l'information obtenue. L'un des gestionnaires de cette catégorie contestait ouvertement la nécessité d'entretenir des relations personnelles. Il disait préférer se fier aux positions et aux structures officielles pour ce qui est du partage d'information.

Le rôle de « transmetteur » a également retenu l'attention. Les personnes qui jouent ce rôle sont souvent qualifiées d'experts de leur domaine. Elles possèdent des connaissances spécialisées ainsi qu'une expertise qu'elles partagent sans égard au fait qu'elles peuvent aussi jouer le rôle de récepteurs d'information. Les partenaires de sécurité non traditionnels, comme l'Agence de la santé publique du Canada (ASPC), faisaient partie de ceux qui doivent continuellement rappeler aux partenaires de sécurité traditionnels que la plupart des événements relatifs à la sécurité soulèvent des préoccupations de santé publique.

Un petit groupe de « transmetteurs » étaient considérés comme des « super transmetteurs », car ils avaient identifié un nombre largement supérieur de personnes avec qui ils avaient décidé de partager de l'information. Généralement, les scientifiques entraient dans cette catégorie étant donné que ces partenaires non traditionnels avaient de toute évidence un rôle interorganisme de plus en plus important à jouer. En effet, si les gens ne les connaissent pas, ils ne tenteront pas d'entrer en communication avec eux. De plus, la mesure dans laquelle ils seront perçus comme des personnes-ressources clés dépend largement de leur aptitude à informer les clients de leurs compétences et de leur expertise ainsi que de la meilleure façon d'interpréter et d'utiliser leurs outils et leurs capacités. Les scientifiques ont aussi besoin d'un certain degré de formation et de sophistication pour composer avec des clients opérationnels qui souvent nécessitent un encadrement pour optimiser leur utilisation des produits scientifiques.

Certains fonctionnaires se distinguaient nettement des autres en agissant comme des « experts du courtage d'information ». Ils semblaient valoriser l'horizontalité si on en juge par le nombre d'acteurs, beaucoup plus élevé que la moyenne, qui les nommaient et qui étaient à leur tour nommés par d'autres, encore une fois dans une proportion largement supérieure à la moyenne. Des cinq premiers de cette catégorie, trois provenaient du BCS et un du Programme intégré de la sécurité. Bien sûr, le personnel du BCS dispose d'un carnet d'adresses très étoffé et d'une crédibilité auprès de plusieurs ministères et organismes. Étant donné que le BCS n'avait de pouvoir direct sur aucune personne et sur aucun ministère ou organisme, « les relations personnelles prenaient toute leur importance ».

Les « experts du courtage d'information » du BCS comptaient donc sur leurs réseaux personnels pour honorer leur mandat, mais ces relations ont aussi servi à faciliter la prise de décisions entre organismes aux échelons supérieurs. Ces experts ont également joué le rôle « d'explorateurs » en aidant des membres d'autres organisations à repérer les personnes-ressources appropriées pour établir le lien entre les organismes. En ayant accès à des organismes comme la GRC, le BCS pouvait servir d'intermédiaire en permettant l'établissement de nouvelles relations.

Certains fonctionnaires jouaient un rôle plus ou moins central dans le réseau tandis que d'autres restaient des acteurs périphériques. Par acteur périphérique, on entend un fonctionnaire qui nommait un nombre considérablement moindre d'acteurs que les autres et qui était nommé par un nombre d'acteurs considérablement moindre que les autres. Les participants de l'étude tombaient dans cette catégorie dans une proportion d'environ 12 p 100. Des personnes ou organisations deviennent acteurs périphériques pour diverses raisons. Parfois, les autres ignorent les connaissances ou l'expertise d'une personne, ou encore, la personne est tout simplement inaccessible. Les organisations dont le mandat n'est pas bien compris peuvent aussi se retrouver en périphérie du réseau. Cependant, le statut d'acteur périphérique n'est pas nécessairement négatif. Il n'est pas indispensable que tous jouent un rôle central, comme certains « transmetteurs » dont les connaissances et les compétences sont hautement spécialisées. Certains jouent un rôle mineur qui n'est pas moins important, mais qui nécessite une intervention ponctuelle seulement. Par contre, une position périphérique peut devenir un problème lorsqu'elle limite la capacité d'un intervenant à connaître la façon dont il pourrait participer. Elle peut aussi limiter la quantité d'information obtenue, ce qui met en jeu l'aptitude de l'intervenant à accomplir son travail. Enfin, si les autres ne connaissent pas l'expertise d'un acteur périphérique, ils ne peuvent pas y faire appel. Le cas échéant, il serait souhaitable de trouver des façons d'intégrer ces acteurs spécialisés dans le cadre d'activités interorganismes afin de veiller à ce que ces ressources soient pleinement utilisées par les intervenants pertinents.

Parfois, une personne peut se trouver en périphérie si l'on compte le nombre de liens avec les autres, mais rester dans une position centrale lorsque l'on évalue la qualité (par opposition à la quantité) de ses relations. Pour les acteurs, le fait d'être lié à des personnes qui occupent une position centrale accroît la probabilité d'avoir un accès privilégié à l'information qui circule dans un réseau grâce au rôle central que jouent leurs personnes-ressources clés.

Le fait d'entretenir un grand nombre de relations peut être avantageux lorsqu'il est associé à un accès potentiellement accru à l'information qui circule dans un réseau. Les positions peuvent aussi être favorables aux acteurs si ces derniers sont en relation avec d'autres joueurs centraux du réseau qui ont à leur tour de bonnes relations. On peut aussi évaluer la centralité des membres d'un réseau en déterminant dans quelle mesure ces personnes sont des intermédiaires, des médiateurs ou des courtiers du partage d'information.

On dit qu'une personne a une position favorable si elle se trouve « entre » un certain nombre d'autres acteurs du réseau. L'importance du statut d'intermédiaire de cette personne peut lui conférer une certaine forme de pouvoir au sein du réseau si les acteurs doivent passer par elle pour joindre d'autres personnes. Lorsque les intermédiaires clés jouent leur rôle convenablement, ils établissent un lien vital avec des personnes ou des groupes qui seraient isolés sans leur intervention. Parallèlement, des intermédiaires réticents peuvent bloquer la circulation d'information et freiner les efforts déployés entre les organismes. Le personnel du BCS s'est classé parmi les dix premiers intervenants en termes de centralité du statut d'intermédiaire.

En évaluant la capacité d'un acteur quelconque de joindre n'importe quel autre membre du réseau, on a constaté qu'une minorité d'acteurs pouvaient joindre tout le monde en franchissant

quatre degrés de séparation. Ce résultat peut laisser croire à une grande contiguïté, mais il est peu commode pour un haut fonctionnaire de communiquer avec le collègue d'un collègue d'un collègue d'un autre collègue pour joindre une personne dans le but d'obtenir de l'information ou de solliciter ses compétences et son expertise. Les gens sont plutôt portés à appeler « l'ami d'un ami ». Quant au personnel du BCS, qui occupe une position très centrale, quatre personnes sur cinq pouvaient joindre la majorité des participants du réseau ou être jointes par des participants en passant par un intermédiaire, tout au plus.

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1. Introduction

Background

Ensuring adequate security for a major event, such as the Olympics and Paralympics Games, is a significant, multi-year effort involving numerous federal, provincial, regional and municipal government partners, as well as a vast web of public, private and international stakeholders. While the RCMP was given the lead for security planning and operations for the Games, the Office of the Coordinator for 2010 Olympic and G8 Security (OCS) was created to both challenge and support their efforts. Being in charge, federally, the OCS brought senior-level attention to the issues and ensured that preparations were well in hand through a coordinated, “whole-of-government” approach.

The 2010 Olympic and Paralympic Winter Games marked the first time that a Deputy Minister level coordinating structure, housed within the Privy Council Office (PCO), was created to manage the “whole-of-government” public safety and security planning for a major international event, in Canada. It is believed that federal interagency relationships were strengthened and cooperation was significantly improved as a result of the OCS-led efforts. Before the OCS was disbanded, September 15th, 2010, the Coordinator asked Defence R&D Canada (DRDC) to undertake an After Event Report (AER) process to identify critical issues associated with federal, interagency coordination generally, as well as involvement in future major event security planning specifically. Being that each federal government department and agency were responsible for completing their own “lessons learned” process, the AER study focused on the issues, relationships and dynamics at the *interface* between the departments/agencies involved in V2010 security planning and operations. It was intended that knowledge be captured and shared for the benefit of security partners and stakeholders.

A multi-method research study was subsequently undertaken by DRDC involving a literature review, a content analysis of past reports, face-to-face interviews with senior leaders, detailed case studies, as well as a Social Network Study (SNA). A comprehensive report of findings was submitted to the OCS for presentation to the National Security Advisor (NSA), September 2010. While some preliminary findings from the SNA study were included as part of the official report, this paper provides a comprehensive analysis and discussion of question six of the SNA (see Annex C).

2. Methodology

Population-of-Interest

The target population for this study were senior-level federal government employees who were involved in V2010 security planning and/or operations. Persons were also included who were believed to be at the interface between senior and operational levels. Some provincial and municipal government employees who were thought to have worked closely with federal officials were also sought. At the outset, the goal was to involve a significant cross-section of individuals who were believed to be key players, to occupy key positions or represent key organizations. As a qualitative research study, the goal was not to capture everyone, but rather to include many to most of the key individuals, as well as a cross-section of traditional and non-traditional security partners in order to capture as much diversity as possible related to federal interagency involvement to secure the Games.

Sampling Frame

A list comprising the main federal government participants in security planning and operations for the Games was not available in order that a probability sample could be drawn. Instead, a list of interviewees was initially drafted following input from members of the OCS, as well as departmental representatives from the AER Coordinating Group. The list represented a convenience sample of 41 individuals who were then contacted for interviews, as part of Phase One of the study. When undertaking a social network study, maximum participation is necessary to ensure that results are accurate and meaningful. Thus, preliminary analysis of the social network findings from Phase One was undertaken to identify and contact additional persons whose participation was deemed to be important in so far their network information was observed to comprise important gaps (Phase Two).

Method

A multi-method research study was undertaken involving two phases of research: (1) Face-to-face interviews with 41 senior government officials involved in Olympic security planning and operations; and (2) The administration of an electronic survey to an additional 73 officials who were nominated by two or more interviewees². Forty of the interviewees and 33 of the 73 survey recipients (45.2%) responded with their social network information. The final sample is a cross-section of mostly senior federal government personnel who were seen to be key contacts for V2010 security planning and operations.

Sample Characteristics

Table 1 shows the characteristics of the total sample population from the two study phases. Included are 458 names, of which 73 were either interviewed or submitted a response to an electronic survey.

Table 1: Sample Population Characteristics

	Total	Percent		Total	Percent
Total Sample	458	100.0			
Federal Government			Municipal		
Canadian Border Services Agency (CBSA)	15	3.3	RCMP	2	0.4
Canadian Security Intelligence Service (CSIS)	20	4.4	Burnaby Detachment	1	0.2
Citizenship and Immigration Canada (CIC)	3	0.7	Surrey Detachment	1	0.2
Defence Research Development Canada (DRDC)	4	0.9	Other	4	0.9
DRDC - MECSS	11	2.4	City of Richmond	2	0.4
Department of Finance	3	0.7	Squamish Lillopet RD	1	0.2
Department of Foreign Affairs and International Trade (DFAIT)	4	0.9	Olympic Business Office	1	0.2

² There were 41 interviews conducted, of which only 40 completed the SNA questions.

	Total	Percent
Federal Government, <i>cont'd.</i>		
Department of Justice Canada	12	2.6
Department of National Defence and the Canadian Forces (DND/CF)	29	6.3
Canada Command	11	2.4
Joint Task Force Games (JTFG)	12	2.6
Health Canada (HC)	10	2.2
Heritage Canada	13	2.8
Indian and Northern Affairs Canada (INAC)	4	0.9
Integrated Threat Assessment Centre (ITAC)	2	0.4
Prime Minister's Office (PMO)	2	0.4
Privy Council Office (PCO)	10	2.2
Privy Council Office - S&I	4	0.9
Public Health Agency of Canada (PHAC)	22	4.8
Public Safety (PS)	19	4.1
PS - GPPAG	2	0.4
PS - Public Safety - Government Operations Centre (GOC)	5	1.1
PS - Public Safety - National Exercise Division (NED)	3	0.7
Royal Canadian Mounted Police (RCMP)	33	7.2
Transport Canada (TC)	9	2
Treasury Board Secretariat (TBS)	8	1.7
Federal - Other	8	1.7
Canadian Tourism Commission (CTC)	1	0.2
CNSC	2	0.4
Environment Canada	1	0.2
Natural Resources Canada (NRCan)	1	0.2
Privacy Commission	1	0.2
Public Works and Government Services Canada (PWGSC)	1	0.2
Service Canada	1	0.2
Other		
Integrated Security Unit (ISU)	40	8.7
Joint Intelligence Group (JIG)	5	1.1
Office of the Coordinator for Olympic and G8 Security (OCS)	10	2.2
VANOC	22	4.8
Region		
Emergency Management B.C. (EMBC)	5	1.1
Integrated Public Health (IPS)	10	2.2
PREOC	5	1.1
Public Safety - Region	2	0.4
RCMP - E Division	4	0.9

	Total	Percent
Vancouver	8	1.7
City of Vancouver	2	0.4
North and West Vancouver	1	0.2
Vancouver Airport Authority	1	0.2
Vancouver Coastal Health	1	0.2
Vancouver Fraser Port Authority	1	0.2
Other	2	0.4
Whistler	5	1.1
Emergency Planning	1	0.2
Municipal government	2	0.4
Olympic Operations Whistler	2	0.4
International		
U.S. Department of Defense	11	2.4
JTF Civil Support	1	0.2
US Coast Guard	2	0.4
US J4 Northcom	2	0.4
US JTF Army North	2	0.4
US Northcom	1	0.2
US Third Fleet	1	0.2
Other	1	0.2
U.S. Embassy	3	0.7
Ottawa	2	0.4
Vancouver	1	0.2
World Health Organization	1	0.2
Academic	2	0.4
UBC	2	0.4
Industry	6	1.3
BC Hydro	1	0.2
BC Transmission Corporation	1	0.2
Bell	1	0.2
Defence Construction Canada	1	0.2
Patrick Roberge Productions	1	0.2
Terasen Gas	1	0.2
Health Sector	14	3.1
B.C. Ambulance	1	0.2
Fraser Health	1	0.2
Providence	2	0.4
Vancouver Coastal Health	1	0.2

	Total	Percent
Province	18	3.9
BC CDC	2	0.4
BC Coastal Health	1	0.2
BC Games Secretariat	1	0.2
CPH BC	1	0.2
Fire Services	1	0.2
Ministry of Public Safety and the Solicitor General	3	0.7

	Total	Percent
Health Sector, cont'd.		
Vancouver Health	9	2

Survey Administration

In order to maximize the response rate, two contacts were used: a prenotice letter; and an email cover letter with a link to an online questionnaire. While some authors have recommended also using a thank you/reminder postcard, and replacement questionnaire (Dillman, 2000), these added contacts were seen as impractical and unnecessary in light of time constraints and the sample size. Those recipients who neglected to respond were reminded by email or phone and encouraged to do so.

Prenotice Letter. The use of a prenotice letter is still believed to be uncommon within research studies completed by DRDC, but it has been consistently shown elsewhere to increase response rates to mail surveys (Dillman, 2000). The letter is used to let people know that they will be contacted. It is meant to build anticipation by briefly describing the goals and benefits of participating in the study (Annex A). For this study, the prenotice letters were personalized in both official languages with the name and address of the recipient and sent by mail. They were also signed by the Coordinator for Olympic Security. Having the Coordinator sign the letter was a way of conveying the project's legitimacy and importance to recipients.

Electronic Cover Letter and Survey. The cover letter and questionnaire were sent out a few days after the prenotice letter. The timing between the first and second contact is important, as a lengthier delay might cause some recipients to forget about the study. While the prenotice letter is used to introduce the survey and build trust and anticipation among recipients, use of a cover letter is meant to provide more detailed information about the survey and to ask for participation (see Annex B). The cover letter describes the purpose of the study, how results will be used, and issues about confidentiality. Like the prenotice letter, the cover letter was personalized in both official languages with the name and address of the recipient.

Much of the same information that was conveyed in the e-mail cover letter was also printed on the first page on the electronic survey. The objectives of the survey was summarized, and the importance of participation, stressed. Also outlined, was the estimated time commitment, confidentiality, and mailing address and whom to contact with questions or concerns. Annex C contains the face-to-face interview guide, whereas, the electronic survey questions are provided in Annex D.

Methodological Discussion

When undertaking a two-stage convenience or limited snowball sampling of this type, a typical question involves who is missing. The study did not undertake a census of senior-level officials. Nor did it involve a representative sampling of those involved in security planning and/or operations. Yet,

the findings suggest that most of the key interagency players were captured in this study. There were few obvious omissions (e.g. two frequently referenced officials declined to participate in the survey).

When observing the distribution of connections between the 306 persons who were identified by the 40 interviewees, one can see that the majority (59.5%) were only mentioned by one of the interviewees; whereas, 44 people were identified by at least two other people, 20 people were identified by three others, and so on for a total of 83 people who were mentioned more than once. Rather than undertake to survey the remaining 266 people, as part of the second research phase, which was thought to pose too great an administrative burden, electronic surveys were sent to 73 (of the 83) individuals whose contact information could be located and who were thought to be more central by virtue of them having been nominated multiple times.

Unfortunately, two of the 73 survey recipients who were nominated six and 11 times, respectively, declined to participate in the survey, which represented the one obvious gap in the response. While appearing to have no outgoing connections will affect their network position, on the one hand, choosing not to participate does not affect the number of times others referred to them as key contacts. Since much of the research involves the analysis of an actor's incoming connections, the fact that some chose not to participate was not believed to unduly affect the analysis contained herein.

The methodological approach that was adopted was to identify and select focal nodes (egos) and have them identify the nodes (alters) to which they were connected. Network data was also supplemented and triangulated based on the results of key informant interviews with the initial 40 persons at, mostly, strategic levels who were perceived to hold key positions and who were thought to be key players in Olympic security planning and operations. Being that Olympic security planning and operations was meant to be a whole-of-government activity, collecting information on individual information-sharing networks was expected to yield a relational network showing an array of ties at strategic and operational levels. Measures of relations were binary, hence were coded as present (coded one) or absent (coded zero).

Another methodological issue involved forgetting. Logically, one might expect the likelihood that participants would forget who their key contacts were would vary inversely with tie strength, perhaps also, the amount of time since the ego and alter were last in contact. For instance, it is possible, even likely, that egos had contacts who were key in the early planning period or what could be several years ago (e.g. during the Memorandum to Cabinet process), but who were not key contacts during later periods, hence more difficult to recall during the study. What the issues concerning recall point to is the manner in which the data can be interpreted. Clearly, the study is looking at a fraction of one's contacts overall, and probably also, a fraction of whom one might consider to be their key contacts. We are not looking to describe a network precisely; therefore, the study has some obvious shortfalls. Given that we are concerned with the structure of the network, forgetting might be seen to pose some serious issues. Perhaps, ideally, social network analysis might have been undertaken at the outset and throughout the Olympic planning period. Still, research by Freeman, Romney, and Freeman (1987) has shown that respondent reports are biased towards longer-term, more enduring patterns of interaction. Where there's a concern that respondents are only reporting on more recent interactions, this other research suggests the likelihood that enduring interactions are being captured.

The face-to-face interviews relied upon the free recall of contacts by the respondents. For question one, respondents were asked to report on "key" contacts. Respondents decided what it meant to be a key contact when answering, so the content of the relationships being measured may vary. Though, given that the social network questions were asked following the interview, it is possible (and certainly appropriate) that the context influenced the generation of names. While it can be argued that the interview questions were helpful for situating and priming the 40 respondents' awareness to the

prior activity of V2010 planning and operations, a structured, non-specific method to aid recall was not otherwise incorporated as part of the face-to-face interviews. Still, during face-to-face interviews, the interviewers would, at times, stress the need to focus on “key” personal contacts. Interviewees would be told to think about contacts outside of their organization. Oftentimes, respondents would also be reminded to think solely of those persons with whom they had a personal relationship versus those who would be included on an email distribution list. Not having the similar ability to address confusion among survey recipients raised the question of whether non-specific prompts to aid recall of alters should be used to limit error. In the end, the same question, but with a specific prompt was used as part of the electronic survey package (see Annex D).

Table 2: Independent Samples Test for Differences In The Number of Outgoing Connections (Outdegree) between Interviewees and Electronic Survey Respondents

<u>Outdegree</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>T¹</u>	<u>P</u>
Interviewees	40	14.63	10.073	1.654	0.102 (2-tailed)
Survey respondents	33	11.18	7.077	(71)	

One can review and contrast the number of contacts that were identified by interviewees, as compared to survey respondents, to see if the different methodological approaches produced consistent findings (see Table 2). While interviewees identified a somewhat greater number of contacts, on average (14.63, as compared to 11.18), an independent samples t-test confirms that no significant difference exists, $t(71) = 1.654$, $p > 0.05$. The means representing the two samples are not shown to be significantly different.

Even though the means representing the two sample populations are not statistically significantly different, one should nevertheless be concerned about the tendency some respondents have to identify a greater number of contacts for the purpose of making themselves appear more favourable. For instance, two individuals among the 40 interviewees managed the social network interview differently than everyone else. Whereas the vast majority reflected on and provided a list of names, when asked, during the interview, one individual came prepared with a list of names and another supplied one in an email following the interview. It just so happens that these two individuals provided a great many more names than did the other interviewees, on average. The reality is that both of these individuals were nominated as key contacts by a disproportionately higher number of others as well, so their list of contacts, while higher still, is certainly in keeping with their network standing. Even so, one should be cautious where the tendency exists to supply a list of names given the apparent likelihood that doing so will yield more contacts than will a process that relies entirely on recall during an interview.

Notwithstanding the above concerns about maintaining a consistent approach for soliciting names, much of the research relies on an ego’s Indegree – the number of times they are nominated as key contacts by alters. Doing so is believed to provide a more accurate reflection of an actor’s network position. Moreover, it eliminates the effects where actors are inclined towards self-enhancement.

3. General Findings

The SNA component of the AER study was undertaken for diagnostic purposes to assess the flow of information between interagency partners on security-related issues prior to and during the Olympic Games. When undertaking the SNA, it is assumed that a chief goal of those involved in Olympic

security planning and operations was to acquire and convey information, in order that senior leaders could make sound decisions. By measuring the structure of formal and informal ties or relationships between government departments and agencies (e.g. who shares information with whom), the SNA study assesses how well the leadership group was effectively sharing information as a basis for the security-related decisions that were made. As such, this study is a structured way of assessing the state of federal, inter-agency cooperation.

This study mostly involves one set of actors (i.e., senior-level federal government employees involved in V2010 security planning and/or operations). It was undertaken to measure the ties that existed between those persons who were themselves involved in V2010 security planning and/or operations, and the persons they identified as key contacts with whom they shared related information (within and outside their organizations). To the extent that an analysis of person-to-person links can reveal important information about the structure of relationships, these will be the subject of analysis in the report. However, individuals' names will not be reported in order to help protect the anonymity of respondents. This report will also examine inter-organizational relationships. Since the study participants are themselves representatives of different organizations, the data will also be aggregated to permit an analysis of the ties between the organizations with whom study participants are affiliated.

The inter-departmental community which is represented in the current study was expected to be somewhat connected given its involvement in what was a "whole-of-government" activity. However, a certain level of connectedness was also expected by virtue of the rationale that led to the inclusion of study participants. The SNA study followed key informant interviews with a significant cross-section of persons at, mostly, strategic levels who were perceived to hold key positions and/or were thought to be key players in Olympic security planning and operations. To the extent that the persons who were selected were believed to be key individuals, the fact that they occupied central positions in the SNA might be viewed to be an artefact of the selection process. However, it should be noted that occupying a key position or being from a key organization in no way implied that one's network position would also rank as key among those included in the study. In fact, part of the analysis assessed the extent to which those organizations which should have played a key role, actually did in the same way that individuals who occupied key positions were viewed by inter-departmental colleagues as being important members in the informal web of information-sharing relationships.

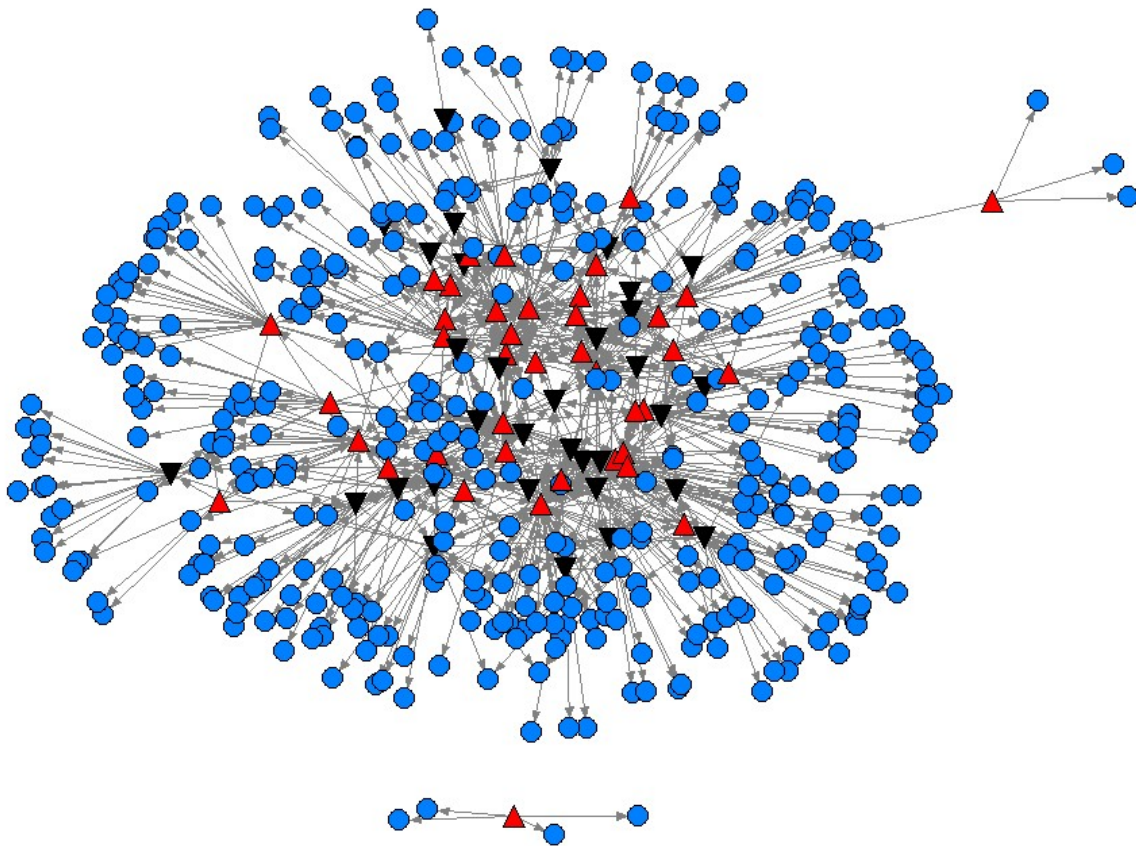
Key Information Sharing Relationships for Individual Nodes

The graph in Figure 1 contains a total of 458 names or "nodes" and 954 links or "edges" representing lines of affiliation based on key information sharing relationships, arising out of research involving 73 participants. Study participants recorded as many names as desired based on their response to the following question: "Who were the key people with whom you shared information on V2010 planning and operations?"³ Persons could come from within or outside their organization. The relations are asymmetrical or "directed" given that participants identified the key persons with whom they shared information. Such relations need not be reciprocated. The fact that person A referred to person B as being a key contact does not necessarily imply that when asked, person B would likewise refer to person A. Also, despite there being two phases of research, only 73 of the 458 individuals (15.9%) supplied their network information. The vast majority were not contacted to supply their key

³ In actual fact, four social network questions were posed to the study participants during both research phases (Annexes D and C). Since the first question was thought to yield the most fruitful information, it was decided that the analysis and discussion in this report would be limited to key information-sharing relationships. Currently, there are no plans to document the findings from the other questions due to resource constraints.

contacts. Those nodes that are highlighted as red and black triangles represent those persons who completed the study; whereas, the blue circle nodes represent all of the individuals who were nominated by study participants as key contacts but who did not provide their network information.

Whereas a complete graph is one in which every node is connected to every other node, after reviewing Figure 1, one can see that not every possible connection is present. It is simply not reasonable to expect that every senior-level official would be in a position to develop and maintain social relations with every other senior-level official involved in Olympic planning and security, nor would it be desirable to exchange information with everyone or considered optimal. Clearly, there were official channels (e.g. Committees and Working Groups) through which pertinent information could be shared between the relevant partner agencies. What Figure 1 represents are the personal and professional relationships that facilitated information sharing regardless of the mode of exchange. In that regard, the fact that two individuals might have shared membership in a Committee or Working Group was not a necessary condition for either to be identified as a key information-sharing contact.



*Figure 1: V2010 Olympic Security Planning and Operations
Complete Affiliation Network Based on Key Information Sharing Relationships*

Note. 458 Nodes in Total (40 represented by those interviewed in Phase 1, shown as Red Up Triangles; 33 survey respondents from Phase 2, shown as Black Down Triangles; and 385 who were nominated but not interviewed or contacted to complete an electronic survey, shown as Blue Circles).

Focusing first on the network as a whole ($N=458$), one can determine that there are at most 33,361 logically possible relationships (e.g. AB is different from BA) given that 73 individuals were questioned (73×457). Since there are 954 directed links in this network, one can determine that only 2.9% of all possible (directed) ties are present ($954/33,361$). For the purposes of providing an overarching view of the level of informal information exchange relationships that exist within the network, as a percentage of the total possible relationships, it may better to view the relationships as being undirected or symmetrical. While it is not necessarily the case that should Bob share information with Mary, she in turn, would share information with Bob, the fact that Bob might view Mary to be a key contact certainly affords the opportunity for the reciprocal sharing of information. Also, the vast majority of those represented in the network (i.e., 384 nodes) were not interviewed, hence were unable to confirm the extent to which the key information exchange relationships that were referred to by the 73 study participants were reciprocal. Viewing the relationships as undirected or symmetrical means that the number of possible ties is 30,660 (e.g. AB is the same as BA; $73 \times 72/2 + 73 \times 384$). This means that 3.1% of all possible (undirected) key information exchange relationships were present among the 458 senior- and operational-level federal and provincial officials who were identified as part of the current study given the limited number of people actually questioned.

When observing the network in Figure 1, one can see that it is not fully connected. Five of the nodes, shown in the bottom left corner are disconnected from the much larger network. That is to say that when information related to Olympic security travelled through the somewhat vast web of (key) informal channels, these five persons had no access to that information. Now, clearly, formal channels for information exchange did exist, for example, the Deputy Ministers' 2010 Security Advisory Committee (DM SAC). One must assume that the individuals could obtain the information of relevance to their organization(s) by way of the formal channels that existed. Based on the current sample, however, it would appear they were cut off from the main group of public sector officials.

A review of Figure 1 reveals some other important features. Most of the people interviewed or surveyed (shown as red and black triangles) occupied fairly central positions in the network, whereas, a few were on the periphery. The majority of the nodes in blue lie on the periphery by virtue of the fact that only 40 actors supplied their key contacts during Phase one, and 33 (out of 73 survey recipients) responded to the electronic survey with their key contacts. One simply cannot tell if the ties were reciprocated being that the majority of actors in blue were not contacted, and among those considered to be more central who were contacted, 40 ($73-33$) chose not to participate in the study.

Notwithstanding the fact that a majority of nodes in blue ($n=385$) were not surveyed, a visual inspection of network in Figure 2 supports the view that most of the key persons at the strategic and operational-levels who were involved in Olympic security planning and operations completed the network study. To add visual clarity, the individuals who were nominated only once ($n=284$) were removed from the network. Since four of the 40 interviewees in Phase one were not nominated by any others, they were also removed. The size of the nodes in Figure 2 was also changed to reflect the number of times an individual was nominated by others in the network (i.e. Indegree). The larger the node the greater the number of incoming connections, which is a useful proxy indicator for an individual's relative prominence. The only obvious gaps would appear to be the two blue nodes (shown as squares). The individuals were contacted but elected not to participate in the online survey. While these nodes still appear quite central, in terms of their number of incoming ties, their overall centrality will be somewhat diminished by virtue of them not having identified their key contacts. Of the remaining nodes in blue, the majority are somewhat peripheral.

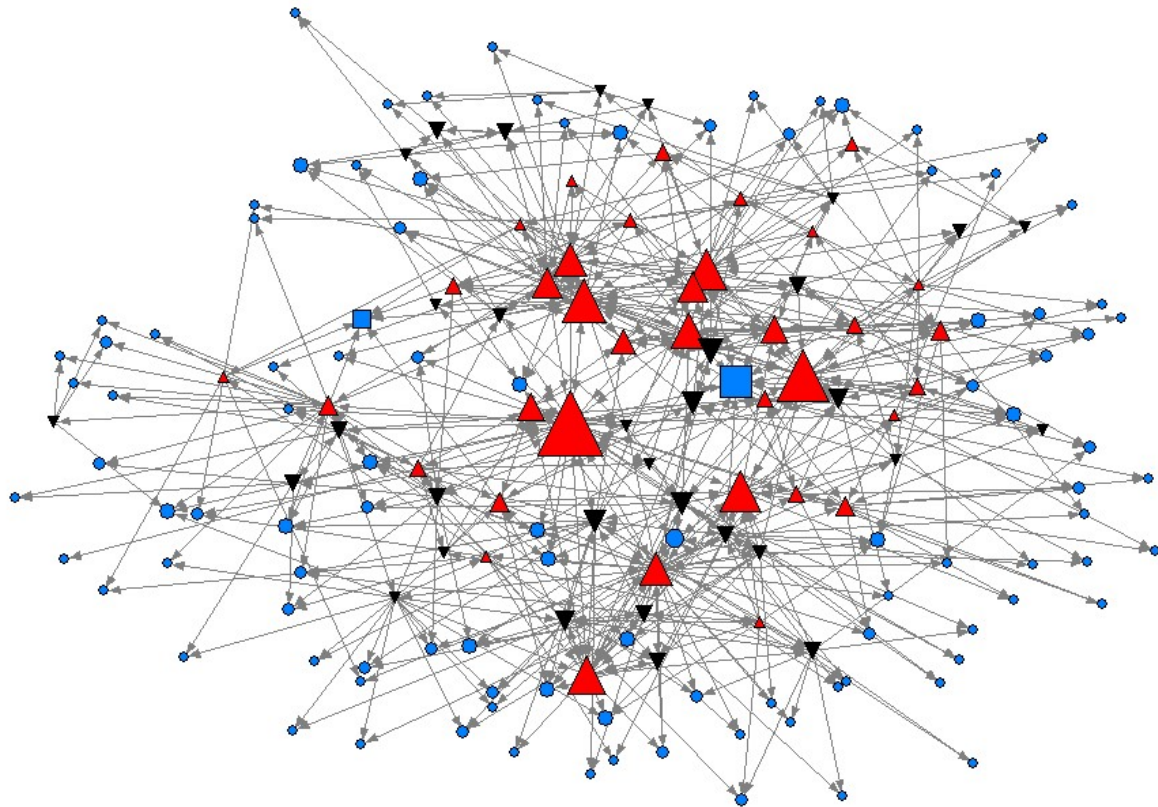


Figure 2: V2010 Olympic Security Planning and Operations Partial Affiliation Network Based on Key Information Sharing Relationships Among Those Nominated More than Once

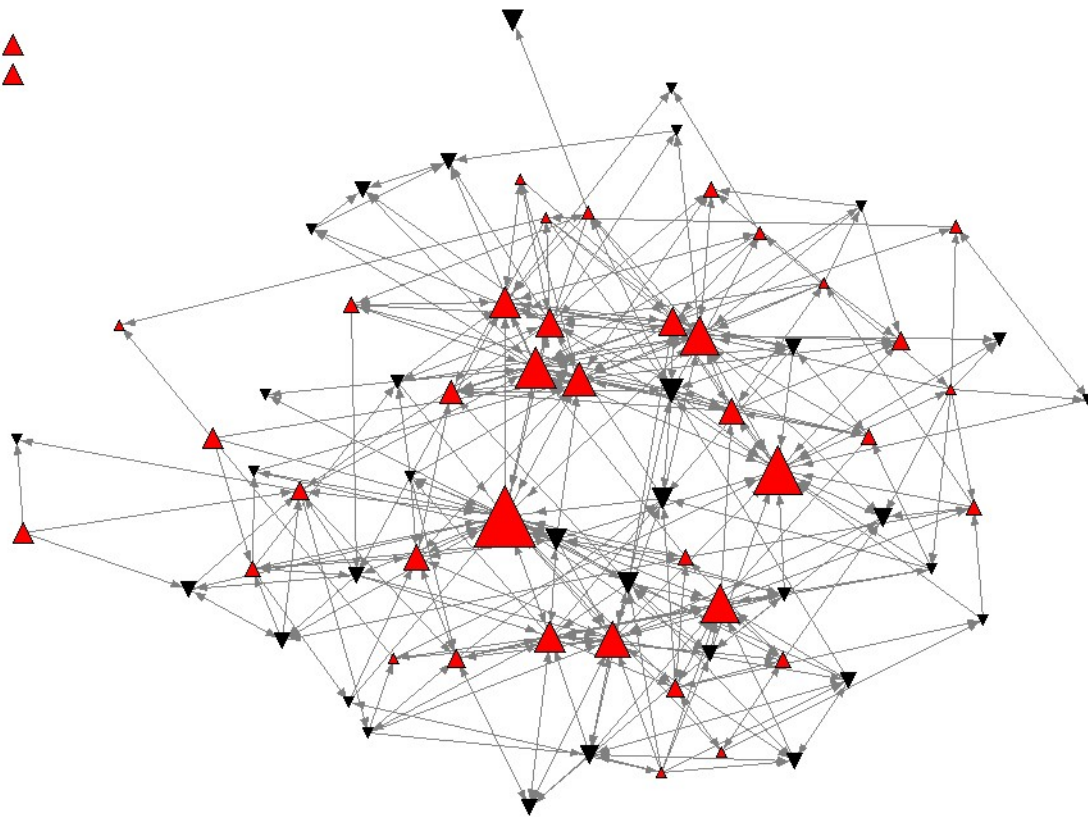
Note. N=170 (101 in Blue; 37 in Red; 32 in Black). The size of the nodes is also shown to vary by “Indegree”.

Figure 3 shows the connections that exist when restricting the focus to those persons who were questioned. What remains are 73 nodes⁴. When the larger sample of individuals (blue circle nodes) is removed, one can also see that two actors are disconnected from the resulting network. Of the cross-section of key decision-makers, across the federal and provincial governments, these two individuals were connected only indirectly to the other study participants. The total number of possible (directed) ties between the main component of this subset (i.e. 71 participants) of the larger sample is 4,970. With there being 390 ties, representing key information exchange relationships, 7.8% of all possible ties among these study participants are present.

It is difficult to gauge the extent to which “horizontality” within the federal government has been institutionalized by virtue of the fact that only a small percentage of the total number of possible ties, within the subgroup of participants, are present in Figure 3. Perhaps, a more useful analysis is to

⁴ Included are all 40 interviewees and 33 survey respondents.

instead focus on the actors' relations by asking what percentage of all possible directed ties are reciprocated (see e.g. Hanneman, 2007). Using the “arc method” to determine reciprocity, among the 71 participants (representing the main component in Figure 3), about 49.7% are shown to have a reciprocated connection. This number would seem to suggest a somewhat high degree of connection within this population. Nearly one in two relationships had been solidified in so far as each individual saw the other as being key information sharing contact. While the presence of a reciprocal relationship may imply and certainly provides the basis for an institutionalized connection – a relationship between organizations that is not wholly contingent on there being a personal relationship between the incumbents of different positions within different organizations – it cannot be assumed.



*Figure 3: V2010 Olympic Security Planning and Operations
Partial Affiliation Network Based on Key Information Sharing Relationships
Among Phases One and Two Participants of the AER Study*

Note. 73 Nodes. The size of the triangles in the graph are in accordance with the “Indegree” or the overall level of connectedness from the others in this sub-network to the actor, when compared to all other n-1 nodes.

When beginning a social network analysis, it is useful to examine the number of connections that are possible and the number that are actually present. However, as the above results indicate, it is virtually impossible for actors in a large network to develop and maintain ties with everyone else. Rather, individual actors will tend to develop relationships with what can be some to many others. As

Hanneman (2007) describes, it is the number and kinds of relationships that actors develop that is key to understanding the constraints, opportunities, influence and power they wield within a network.

Degree Centrality

With directed ties, the analysis can distinguish between incoming and outgoing connections, referred to as Indegree and Outdegree, respectively. “Indegree” refers to the number of times an actor was nominated as a key contact by others in the network. Individuals with higher values can be said to have a greater number of incoming or *receiving* connections. Indegree is shown to vary from Outdegree, in so far as the latter captures the number of outgoing or *sending* ties (Parker and Scott, 2006). As previously indicated, being that the actors in blue were not interviewed to nominate key contacts, their Outdegree is zero. Therefore, it is not useful to refer to Outdegree in the context of the complete network diagram, but rather to compare these values within the subgroup of interviewees.

The number of incoming connections (Indegree) varied from zero to 26. While four (0.9%) of the interviewees in Phase One have an Indegree of zero, since they were not identified as a key contact by any of the others⁵ who were questioned, the vast majority (96%) of those in the network had between one and six incoming ties. The majority (62%) were identified as a key contact for purposes of information sharing by one individual, whereas, slightly less than one in five individuals (17%) were identified by two others. Five individuals, among the 458 in the sample, were identified by upwards of 15 others as being key contacts, which places them in the 99th percentile. Three of the five individuals were from the OCS, whereas, two were housed within the Integrated Security Unit (ISU).

Table 3: Degree Centrality Statistics for a Directed Graph

Statistics	Indegree		Outdegree ¹
	Total Sample	Participants	Participants
N	458	73	73
Mean	2.08	5.34	13.07
Median	1.00	4.0	13.00
Mode	1	2	20
Std. Deviation	2.562	4.843	8.956
Range	26	26	52

Notes.

¹The statistics for Outdegree take into account all of the 73 participants’ outgoing ties.

When reviewing the statistics for Indegree for the subset of 73 study participants, a somewhat different picture emerges (column 3 of Table 3). The median number of incoming ties among participants was four, as compared to one for the entire sample. In light of the different results, an independent samples t-test was used to test for mean differences between the sample of 73 study

⁵ A majority of interviewees were selected based on views about their relative prominence among those involved in Olympic security planning and operations. However surprising, this result is evidence of another important rationale for the interviews. Some of the interviewees were selected based on their role, position, department/agency affiliation. In addition to interviewing those persons who were believed to be key players, another goal was to interview a diverse cross-section of relevant, in some cases, non-traditional players.

participants and the remaining 385 individuals who were not contacted to supply their key contacts. Since we must reject the null hypothesis of equality of variances ($F = 207.44$, $p > 0.001$) based on the results of the Levene test for equality of variances, the null hypothesis of no difference must be rejected. Based on the prediction that participants are more likely to have a higher Indegree than non-participants, a one-tailed test was performed (i.e. the significance value was divided by two). The t-test revealed that the sample of 73 study participants tended to have a significantly greater average number of incoming connections than non participants, $t(73) = 6.814$, $p < 0.001$. The results confirm the view that study participants tended to be much more central than non-participants (see Table 4).

Table 4: Independent Samples Test for Differences In Indegree by Study Participants and Non-Participants

<u>Indegree</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>T</u> ¹	<u>P</u>
Study Participants	73	5.34	4.843	6.814	0.00025 (1-tailed)
Non-participants	385	1.46	1.005	(73.18)	

Note.

¹The Levene test for equality of variances produced a significance value of $F=207.44$ ($p<0.0005$). Hence, the t-test statistic is based on the results when we reject the null hypothesis of equal variances.

Further variation is observed when comparing Indegree and Outdegree for the subset of 73 study participants in relation to the complete network (column 4 of Table 3). For one, there would appear to be a considerably higher number of outgoing, as compared to incoming connections, on average (13 as compared to five). Also, there appears to be much greater variation in outgoing as compared to incoming ties ($SD=9.0$ versus 4.8). While it would appear that study participants, on the whole, have much greater outgoing than incoming connections, further analysis reveals the likelihood this observation is merely an artifact of the research methodology. The vast majority of the study participants ($n=385$) were not contacted to provide their list of key contacts. When the values for Outdegree are constrained to the subset of 73 participants, the gap is virtually closed between the two sets of findings (e.g. Outdegree Mean= 5.34 , Median= 5.0 , Mode= 3). When a paired-sample t-test is performed to test whether the Indegree mean ($M=5.34$) differs from the Outdegree value ($M=5.34$), the results find they are not in fact, significantly different ($t=-0.000$, $p=1.000$). So long as the actual study participants ($n=73$) are significantly fewer in number than those represented in the network ($N=458$), there remains the likelihood that incoming ties will be underreported, which can lead the mistaken assumption that outgoing ties are greater.

Given the possibility that with greater participation, statistics for Indegree would come to mirror those for Outdegree, findings associated with the latter warrant scrutiny. The Outdegree statistics are much higher than those for Indegree, on average. Certain individuals among the 73 study participants reported a very high number of outgoing ties with 17 individuals identifying 20 or more key contacts.

The fact that 58% of participants identified upwards of 13 key contacts, and almost one in four (23%) reported between 20 and 53 key contacts, appears indicative of prevalent attitudes favouring interpersonal, even inter-organizational, working relationships, a view which is supported by the data arising from the interviews. The importance of developing and leveraging personal relationships was highlighted by the vast majority of interviewees as being of critical importance to the successful planning and operations of the Games. One interviewee referred to his own contact list, and while he honoured the formal process, he said, "...everybody knows you have your own contacts". Another

interviewee cited the importance of the formal committees, for example, the Assistant Deputy Ministers' Emergency Management Committee (ADM EMC), for developing relationships and providing a sense of what others were doing. Though, from his perspective, he could not recall an occasion where a Deputy Minister would return from a meeting, for example, inform him of an agreement being developed and suggest he become involved. His involvement was very much "bottom-up" based on his own relationships. When describing the importance inter-agency relationships had for planning and operations, yet another official said it was really being able to pick up the phone and talk to the personal contacts that he established outside of his own organization.

Information Sending and Receiving Roles

The following analysis examines several different types of roles that officials were believed to exhibit based on the relationship between their number of incoming and outgoing connections. According to graph theorists, there are four different kinds of nodes in a directed graph based on the relationship between an actor's Indegree and Outdegree: an isolate, transmitter, receiver and carrier or ordinary node (Wasserman and Faust, 1994). What follows is a detailed analysis of the roles of network actors based on an adaptation of the above typology of different types of nodes.

The first type of actor is referred to as an "isolate" in so far as their In- and Outdegree equals zero. These persons are the ones who are completely isolated in a network, of which there are no such individuals in the current network. All of the persons in this study either nominated others as key contacts or were themselves nominated as key contacts by others.

Actors with a large Indegree are believed to receive more information from more sources than those with a smaller Indegree. Similarly, those with a small Outdegree are believed to be sharing information with fewer others than those with a larger Outdegree. According to the classification, when an actor's Indegree is greater than zero, and their Outdegree equals zero, they correspond to a second kind of node – referred to as a "receiver" or what might be an "information sink." Most managers are probably "receivers" in so far as their subordinates – the persons from whom they receive information – are likely to be more numerous than their superiors, the persons to whom such information is relayed. A receiver might be viewed as being an "information sink" when they receive information from many sources, but elect to share that information with relatively fewer others⁶.

Being that every interviewee nominated at least one key contact (an Outdegree > 0) the study does not contain a textbook example of a pure "receiver." However, "information sinks" surely existed. Interviewees provided examples of having to go above the heads of uncooperative interagency colleagues to have them replaced. As one senior official explained, "over the years, several people on steering committees [would] disappear, and the people who tend to disappear are the ones who can't get along". According to him, "if you're not getting the cooperation from that particular individual, you've got no choice but to go over their head..." A revision to the typology is warranted, which takes into consideration an actor's relative standing in the network. Of interest were those individuals who received information from a much greater than average number of sources, but who in turn, cultivated relationships with few others, thereby constraining their ability to share information.

For the purpose of this analysis, an "information sink" refers to those actors who were nominated as a key contact by a much greater than average number of others (i.e. an Indegree equal to or greater than the 76th percentile; seven or more incoming ties), while at the same time, having themselves nominated considerably fewer people than most others (i.e. an Outdegree equal to or less than the 24th

⁶ Supplementary information is needed to justify classifying a node as an "information sink".

percentile; six or fewer outgoing ties).⁷ Simply put, these persons are thought to have received information related to Olympic security plans and operations from numerous sources through informal channels, while at the same time, utilized those channels to cultivate relationships with only very few others, relatively speaking, as a basis for passing along the information they received.

Three actors (4% of the sample) were classified as “information sinks” in Table 5. Recall, these actors were nominated by an exceptional number of other actors, hence they were in a position to receive much event-related information, but they identified only very few people with whom they shared such information. Interestingly, the one interviewee expressed views that are quite consistent with this classification. He was one of the only interviewees who believed that making use of personal relationships or what he referred to as a “personal approach” was not a valued or even appropriate way to go about passing event-related information. Rather, “process” is what he deemed to be most important. “We try to use a systematic approach, as opposed to a personal approach,” he said. While he would get what he referred to as “personal calls” he saw those more as “one-offs.” This in spite of the fact nine other individuals – placing him in the 83rd percentile – identified him as being a key contact. Where there were problems with particular people and organizations, he preferred to rely on existing people and processes for documenting and addressing them. Unlike most other interviewees, this person felt that using personal relationships was akin to taking a “shortcut”. He viewed the idea of taking shortcuts to be something negative, in so far as relationships can be used to circumvent others’ responsibilities and formal processes. In contrast, the idea that key contacts can provide a “shortcut” is probably one reason why most actors believed their relationships were highly beneficial. However, relationships were not simply a “shortcut” for the vast majority of interviewees. Personal relationships permitted interagency efforts to unfold. They allowed for mutual understanding and the development of trust, which arguably, was the basis through which collaboration occurred. However, it is important to recognize that without formal processes, once personal relationships disappear (e.g. people change substantive positions or organizations), the ability for two organizations to work together also disappears, until such time as successors are motivated and able to re-establish rapport. Thus, institutionalized relationships and processes can also permit informal relationships to flourish.

⁷ While initially it was proposed that individuals who were nominated by a greater than average number of others, whilst at the same time, were themselves nominated by a less than average number of key contacts would be used as the basis for classifying nodes as “information sinks”, the Indegree and Outdegree means (n=73, Indegree M=5.34, Outdegree M=13.07) were seen to be unreliable given the high degree of variability and skewness in the sample population for both statistics (Indegree SD=4.843, Skewness=1.974, Kurtosis=4.668; Outdegree SD=8.956, Skewness=1.839, Kurtosis=6.208). As such, when classifying actors as “information sinks”, the 76th percentile (i.e. those actors with seven or greater incoming ties) was selected to be the most appropriate and conservative measure of relative standing for Indegree. It identifies the top fourth quarter of nodes having a significantly greater number of incoming ties. In a similar vein, the 24th percentile (i.e. those actors with six or fewer outgoing ties) was believed to a more appropriate and conservative measure of relative standing for Outdegree. It identifies the bottom first quarter of nodes having disproportionately fewer outgoing ties. Moreover, it should be noted that a less conservative criterion (i.e. 26th percentile or Outdegree=7) did not capture any additional nodes when combined with the value selected to assess relative standing for Outdegree. The 24th percentile would therefore appear to be a natural point of segregation for purposes of analysis. While other researchers might prefer to select other values for purposes of classification, the first and fourth quartiles were believed to provide a suitable balance between the need for conservatism and the desire to achieve the maximum relative difference between an actor’s In- and Outdegree, in keeping with the definition of an “information sink”.

Table 5: Typology of Individual Nodes in a Directed Graph

Classification		N (%) ^a	Organizational Affiliation ^b
Transmitters	Regular ¹	4 (5.5)	e.g. INAC, ISU JIG, PHAC, Justice
	Super transmitters ²	5 (6.8)	e.g. CSIS, DRDC MECSS, Health Sector, PREOC
Information sinks ³		3 (4.1)	RCMP, PS GOC, ISU
Expert brokers ⁴		4 (5.5)	OCS, IPS
Periphery ⁵		11 (15.1)	e.g. TBS, CBSA, Transport

Note.

^a Based on N=73 study participants. Categories are not mutually exclusive.

^b Results are based on individual cases, but in order to protect respondent anonymity, only certain examples of their organizational affiliation is provided. The analysis by no means assumes that all persons from the same organization fall within the same classification group. Nor is it assumed had others from the same organization been interviewed they would fall within the same classification group. These are merely examples of the roles some actor's were presumed to exhibit during security planning and operations based on their number of key incoming and outgoing information sharing relationships, and their relative standing on each when compared to all others.

¹ *Transmitter* if Indegree (d_i) of node $n_i = 0$ and Outdegree (d_o) of node $n_i > 0$

² *Super Transmitter* if $d_i(n_i) \leq 35^{\text{th}}$ percentile and $d_o(n_i) \geq 71^{\text{st}}$ percentile

³ *Information Sink* if $d_i(n_i) \geq 76^{\text{th}}$ percentile and $d_o(n_i) \leq 24^{\text{th}}$ percentile

⁴ *Expert broker* if $d_i(n_i) \geq 86^{\text{th}}$ percentile and $d_o(n_i) \geq 78^{\text{th}}$ percentile

⁵ *Periphery* if $d_i(n_i) \leq 35^{\text{th}}$ percentile and $d_o(n_i) \leq 24^{\text{th}}$ percentile

A third type of node can be referred to as a “transmitter” of information. These types of nodes have an Indegree equal to zero combined with an Outdegree that is greater than zero. Such persons are likely to be subject matter experts. They possess specialized knowledge and expertise that is shared irrespective of whether they are also the receivers of information flows.

Based on the results in Table 5, four actors (5.5% of the sample of 73 study participants) can be classified as “transmitters” of information. Not having been nominated as key contacts by the central cross-section of mostly senior-level officials, they nevertheless occupied important positions or had important roles to play based on their desire to share specialized knowledge or perspectives with the broader community of security stakeholders.

It is not surprising that actors from organizations, such as Public Health Agency of Canada (PHAC), show up as *transmitters*. Traditional security-intelligence organizations are charged with identifying and preventing threats, as well as investigating and apprehending criminals. These mandates tend to be very different than non-traditional partners, such as PHAC, which is responsible for preparedness, response, and recovery for any event for which there's a health impact or consequence. Yet, as one interviewee argued, most security events – whether it be threats to critical infrastructure (e.g.,

hospitals), internationally protected persons or a Chemical, Biological, Radiological, Nuclear or Explosives (CBRNE) related threat – create concerns for people’s health. The fact that security partners tend to overlook the role of partners, such as health, was viewed by one respondent as being the reason why The World Health Organization (WHO) was at the Games – to help promote this idea. In the end, the interviewee was “very pleased with the interdepartmental collaboration” and despite the fact that improvements can be made, he believes “we are further ahead than other countries”.

Clearly, those individuals who were not nominated by any of the others, but who nevertheless, identified some to many others with whom they shared information, can be referred to as “transmitters” of information, in accordance with the classification scheme. However, in light of the approach taken by this paper, which examines the relative standing of individual actors as a basis for assessing the extent to which they occupied different roles in the network, a revised definition is needed. In much the same way that “information sinks” were defined based on their relative standing with respect to their number of incoming and outgoing relationships, a related category, referred to as “super transmitters” is proposed: those individuals who were themselves nominated by inordinately fewer others as being key contacts for purposes of information sharing, whilst at the same time, identified a much greater than average number of others with whom they elected to share information. The revised classification involves actors with an Indegree less than or equal to the 35th percentile; two or fewer incoming ties), and an Outdegree equal to or greater than the 71st percentile; seventeen or greater outgoing ties).⁸ A separate group of five actors falls into this revised category from a variety of organizations. The identified persons each shared information with more sources than 70% of the other study participants, despite being identified by very few others (e.g. about 65% of the study participants had a greater number of key incoming connections than those in this category).

Scientists were among the actors that fell within the category of being *super transmitters*. Similar to role of health officials, scientists can also be viewed as non-traditional partners who arguably, have an increasingly important interagency role to play. The extent to which they will be seen to be key contacts, however, will largely depend on their ability to educate clients about their skills and expertise and how to best interpret and make use of their tools and capabilities. At the same time, as one respondent remarked, scientists and academics needed a certain amount of “training and sophistication” for dealing with operational clients who needed to be educated on how best to make use of science products. It was said that officials had difficulty knowing how best to make use of simulation products as one example.

During the security planning and operations, one can argue that scientists were brought in by operational-level clients who believed that their presence would provide a value added service, regardless of how well their role was initially defined and the extent to which their skills and expertise were broadly understood by others. Generally speaking, if people are unaware of either the scientists or their skills and expertise, they won’t connect with them. Even so, there is certainly no

⁸ When classifying actors as “super transmitters”, the 35th percentile was selected to assess relative standing for Indegree. It identifies the bottom nearly one third of those questioned who had significantly fewer incoming ties. By contrast, the 71st percentile or higher was selected to assess relative standing for Outdegree. It identifies the top nearly one-third of participants who had disproportionately greater outgoing ties. The 71st, as opposed to 75th, percentile was selected due to the fact that this value broadens the category of nodes to five, as opposed to three; whereas, reducing the value still further to the 68th percentile (16 outgoing ties) does not capture any additional actors. While other researchers might prefer to select other values for purposes of classification, the 35th and 71st percentiles were believed to provide a suitable balance between the need for conservatism and the desire to achieve the maximum relative difference between an actor’s In- and Outdegree, in keeping with the definition of an “super transmitter”.

reason to expect that scientists would be widely nominated by senior-level officials outside of their client group. Having too many incoming ties could also be seen as a detriment by scientists if the demands from having a high degree of connectedness distract them from doing scientific research.

The fourth type of node has two aspects, which is associated with a positive In- and Outdegree. Where persons have an Indegree and Outdegree that equals one, they can be viewed as simple “carriers” of information. Where both values are greater than zero, Wasserman and Faust refer to these actors as being “ordinary”, which arguably, will be a way of characterizing the majority of actors in the network. Though, being “ordinary” is by no means pejorative. It simply means that such actors are the receivers and senders of information, which is precisely what is expected in an interagency context.

For purposes of the current study, two other distinctions are warranted. First, rather than look at who was “ordinary,” it is worth considering which, if any, actors can be viewed as *extraordinary* in terms of their level of interagency involvement. Clearly, “super transmitters” were extraordinary in terms of their ability to reach out to clients with information products. The label: “expert broker” of information is proposed for another kind of node that was exceptional in terms of their relative standing for both In- and Outdegree. These are the persons who really stood out amongst the rest and who were believed to value *horizontality* in so far as they were nominated by a much higher than average number of actors (i.e. an Outdegree equal to or higher than the 78th percentile; 20 or more key outgoing ties), and were themselves nominated by a much higher than average number of others (i.e. an Indegree equal to or higher than the 86th percentile; ten or more incoming ties)⁹.

Four individuals fell within the category of being “expert brokers”. Three were affiliated with the OCS, and one was a member of the IPS. As a contrast to “information sinks”, each of these individuals was viewed as being very well connected. Their number of key outgoing ties ranged from 20 to 53, whereas, their number of key incoming ties ranged from 10 to 26, which means that they had a greater number of outgoing and incoming connections than 78% and 86%, respectively, of all study participants. In referring to the OCS, one interviewee said, they clearly had a large “rolodex” to draw upon in addition to credibility with several different government departments and agencies. Since the staff in the OCS lacked direct control over any other individuals, “it all came down to personal relationships”. As one senior official explained: “it comes down to how you manage [your relationships with] people, how you get along with people.” For the OCS, utilizing personal connections within the various departments and agencies, for the purpose of making decisions, was compared to “running a trap line”. Having the right connections was seen as vital to ensuring that departments and agencies were properly engaged when decisions needed to be made.

“Expert brokers” relied on their own personal networks for doing their work, but these were also leveraged to serve supportive functions. For instance, one’s contacts were often used to facilitate inter-agency decision-making at higher levels. Before a Deputy Minister would call and speak to his counterpart in another department, there were times where subordinates would provide a “heads up” to a key contact at their level within that department. Doing so provided an opportunity to learn about and/or share potential issues or concerns in order that they could be properly considered and dealt with prior to or during the subsequent call between senior leaders. Acting as “pathfinders”, brokers could also help individuals from one organization to find appropriate contacts within another organization. Having “inroads” into other departments and agencies meant that brokers could act as intermediaries by facilitating the development of new relationships between persons within and

⁹ The decision to select the 78th percentile for Indegree and the 86th percentile for Outdegree was a judgement that was made based on relative distribution of actors in the network.

outside the other organization. Having previously established relationships, the brokers were in a position to “vouch” for individuals, which was viewed as being particularly important for the development of relationships between those within and outside the RCMP. By “smoothing the waters”, the brokers gave newly acquainted individuals room to establish rapport and develop a relationship. Clearly, the expert brokers were unique given their number of inter-agency connections and credibility, as well as the value they clearly placed on horizontality and interagency collaboration.

Whereas an “expert broker” corresponds to those who had a very high degree of interagency involvement, a second distinction is proposed that contrasts these with nodes whose interagency involvement was very limited and placed them on the “periphery” of the network. An actor was considered peripheral if they nominated and were nominated by significantly fewer actors than others (e.g. Indegree and Outdegree equal to or less than the 35th and 24th percentile, respectively; an Indegree less than or equal to two and an Outdegree less than or equal to six).

Those individuals were classified as being on the periphery of the network by virtue of them having only very few incoming and outgoing connections. About 15% of study participants fell into this category. Generally speaking, there can be various reasons as to why individuals or organizations are peripheral. It may be that others are not aware of a person’s knowledge or expertise, whereas, others are simply inaccessible (Cross and Parker, 2004). An organization whose mandate is not well understood by others can also place them on the periphery. A notable example is provided by one interviewee who said that early on, other security officials were believed to know very little about the Ministry of Transportation, and how the airspace can be secured for a major international sporting event. Being on the periphery meant that Transport was not a part of the 2002 security budget for the Olympics. According to the interviewee, they had to sort of “bully” their way in because others were not aware of their need to be included. Even now, judging by the results of the SNA, Transport might still be viewed as somewhat peripheral in terms of their position in the web of information flows among federal security officials. However, Transport was thought to have played an important, albeit highly specialized role, in augmenting the planning ability and resources of the ISU to manage the security responsibilities associated with aviation, marine and rail, despite being seen as peripheral.

Being on the periphery is not always negative. Not everyone needs to have a central role, as is the case with some *transmitters* who have highly specialized knowledge or skills. Others have important, albeit minor roles and simply feed in where necessary. Being on the periphery is a concern, however, when it limits an actor’s ability to learn of the ways in which they should be involved. Being on the periphery can severely limit the information a person obtains, hence their ability to do their work (Cross and Parker, 2004). It is also a problem when knowledge and skills are not being utilized because others do not know they exist. Heritage hosted a committee for Deputy Ministers across the federal government in order to keep them informed about planning. The Privy Council Office hosted a similar DM-level Committee (DM SAC) for managing security-related issues. While these committees were no doubt useful, as one person remarked, he still had to develop and leverage his own personal contacts in order to learn about the ways in which his organization should be involved.

Closeness

There are disadvantages where individuals have fewer, as opposed to greater connections. Being on the periphery can limit the information that people receive, as well as their choices for how they go about completing their work. It can also constrain a person’s social influence and power (Hanneman, 2007). However, there are times when a person who is on the periphery in terms of their number of connections to others, but they are still central by virtue of the quality (vice quantity) of their ties.

Unlike degree centrality, which looks at the number of incoming and outgoing ties a person has, closeness centrality measures the extent to which an actor is close to many other people in a network (Cross and Parker, 2004). Having fewer connections with other well connected people can mean that individuals will still receive important information much more quickly than others in the network.

Of particular importance is a finding related to the ability of any one actor to “reach” every other actor in the network. Recall that 385 nodes which were not directly involved in the study have no outgoing ties. These nodes are only connected to the network by virtue of one or more incoming ties. If reach centrality were calculated without first symmetrizing the data (i.e. turning “directed” data into “undirected” or “symmetric” data), these individuals would have a reach centrality of zero. In other words, it would appear as though they could not “reach” anyone else in the network. Clearly that would not be the case. The same can be said for the four regular “transmitters” who were referred to in the previous analysis as having no incoming ties. Being that these actors were *sending* and not *receiving* information, technically, they were not *reachable* by others in the network¹⁰. Practically speaking, all of these individuals were in contact with others in the network, and such interactions will have provided opportunities for the reciprocal exchange of information or the opportunity to seek referrals. As it concerns the latter, it is simply important to recognize that people with technical expertise or specialized knowledge will, at times, become underutilized when others in the network do not know how to contact them or are unaware of their knowledge or skills. The extent to which these individuals were properly utilized cannot be assessed by way of this report. However, ways to integrate those with specialized knowledge and skills warrants consideration when undertaking interagency activities in order to ensure they are being fully utilized by relevant others.

For the purposes of calculating reach centrality on the network, it shall be assumed that all links are “undirected” or symmetric. Based on this assumption, one can determine of the 453 actors in the network, a sizable percentage (upwards of 38%) could reach everyone else in four degrees of separation¹¹; whereas, the vast majority could reach everyone within five degrees of separation. When focusing exclusively on the network (main component) of study participants (n=71)¹², the percentage of nodes that can be reached from each actor in each step increases dramatically, even where the data is not symmetric. Virtually every node could reach every other node within four degrees of separation¹³. That means that any one study participant could contact any other using referrals from, at most, four people. While this seems to denote a high degree of reachability, one needs to consider the practicality of a senior official contacting the colleague, of a colleague, of a colleague, of a colleague, in order to reach someone for purposes of acquiring information or to leverage their skills and expertise. This is in light of the much greater reach centrality that exists among the community of study participants, as compared to the entire sample. People are more likely to call the “friend of a friend”, according to Parker and Cross (2004), and are less likely to continue searching for referrals. People are also less likely to respond when contacted by a total stranger.

¹⁰ At times, people with technical expertise or specialized knowledge will become underutilized when others in the network do not know how to contact them or are unaware of their knowledge or skills. The extent to which these individuals were properly utilized can not be assessed by way of this report. However, ways to integrate those with specialized knowledge and skills warrants consideration when undertaking interagency activities in order to ensure they are being fully utilized by relevant others.

¹¹ The network has 458 nodes, but not all actors are reachable by everyone else by virtue of there being two isolated components. Hence, the five actors comprising one component were removed for purposes of analysis.

¹² The number is reduced from 73 to 71 after extracting the main component of the network of study participants due to the fact that two nodes are disconnected from the sub-network.

¹³ After the main component (n=72) was symmetrized, the majority of nodes could reach each other in three degrees of separation.

Given that the OCS was responsible for coordinating the activities of a much broader group of stakeholders, it may be unsurprising to learn that four out of the five OCS staff could reach between 63 and 86 percent of the others in the network of study participants (n=71) based on, at most, one referral; similarly, the staff were “reachable” by a majority of others (69-83%) based on one referral.

While “reach centrality” examines the portion of all others an actor can reach in one, two or more steps, another way to think about “closeness” is to calculate a statistic called “Farness”. “Farness” is the sum of the lengths of the shortest geodesic path distances from each actor to all other actors in the network (Hanneman, 2007). Since the information network is directed, separate statistics for farness for outgoing (outFarness) and incoming (inFarness) relationships were calculated and shown in Annex E. The lower the value the closer an actor is to all others in the network. The lower the value for “outFarness”, the greater an actor’s ability to transmit information that will be received by the most number of others. Similarly, the lower the value for “inFarness”, the greater the likelihood that an actor will become privy to information that is passing through a network by virtue of how central are his key contacts.

Statistics for closeness provide an opportunity to also examine two types of nodes from Table 5. Eleven individuals were labelled as being peripheral when examining different types of nodes in the previous analysis, as defined by their relatively limited number of connections to others. The fact that they had few connections would have been less important if they were on the receiving end of information from other central individuals in the network. For ten of the eleven actors, this does not appear to be the case, as none of them ranked highly in terms of closeness. In most cases, these individuals were the ones feeding information to others, including the OCS. Because they were not identified as key contacts by those who were central, it simply meant that they were less likely to be the one’s receiving information that was passing through the network. Though, one of the nine, who was from the RCMP, ranked first in terms of ‘inFarness’. Even though his number of incoming and outgoing ties was insubstantial, he was viewed as a key contact by two central players from the OCS.

The last type of node that warrants further consideration were those labelled as “information sinks”. Recall, these three individuals were viewed as key contacts by a higher than average number of others, but they did not develop and utilize interpersonal relationships to the same degree as some others for purposes of sharing information. Instead, they preferred to rely on formal communication channels (e.g. distribution lists) and reports for relaying information. All three individuals ranked in the top twenty in terms of “inFarness”. The one individual who spoke against the need to cultivate personal relationships ranked 12th, which meant he was on the receiving end of information from some very central actors in the network. He ranked similarly in terms of “outFarness” (14th), which means of the few people he identified as being key contacts, one or more were also fairly central. In this case, one of his key contacts was from the OCS, which no doubt, contributed to his centrality in the network. Clearly, one needs to consider the quality, versus merely, the quantity of one’s information sharing relationships. As this case demonstrates, being connected to only a few contacts can still be advantageous to a network if one or more of those contacts are central.

Key Intermediaries

As we have seen, an actor can hold a favoured position in a network by virtue of their number of incoming and outgoing ties in so far as a greater number of ties are believed to provide them with greater access to the information that flows through a network. Positions can also be favourable if actors are connected to other central players in the network who are themselves well connected. This section involves a third measure of centrality having to do with the extent to which persons in the

network are key intermediaries, mediators or brokers. One measure has already been examined that defines a “expert broker” as a person who has a significantly greater than average number of *outgoing* and *incoming* relationships. The current section provides another way of defining a “broker” as someone having positional advantage in so far as they reside “between” a number of others in the network. Having a high “betweenness” can represent a form of power in a network if other network actors must depend on them as intermediaries to broker connections. Yet, the reality is that when key intermediaries function well, they serve as a vital “bridge” connecting otherwise disconnected individuals or groups. When there are “reluctant” intermediaries, however, they can obstruct the flow of information and hinder the development of relationships, which impairs network effectiveness.

As one might expect, four of the five OCS staff ranked among the top five, and the fifth member ranked among the top ten in terms of betweenness centrality (see Annex E). In the same way that three of the five individuals were classified as “expert brokers”, based on their number of incoming and outgoing connections, the OCS members, broadly speaking, can be referred to as “skilled intermediaries” in so far as they operated between the most numbers of others in the network.

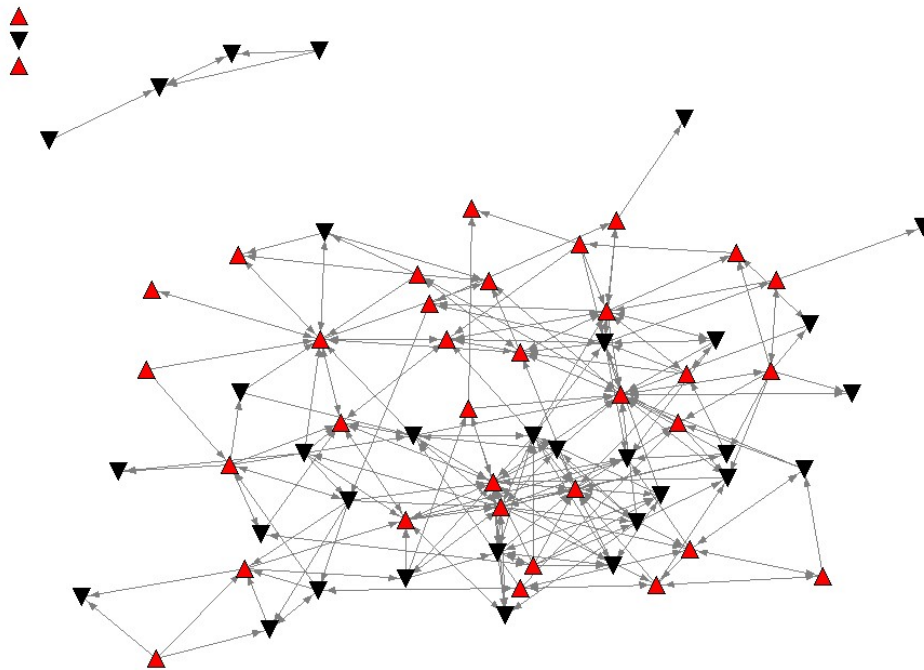


Figure 4: Network of Study Participants Following the Removal of the OCS Staff Members

Note. n=68.

Table 6: Degree of Fragmentation in the Network Following the Removal of the Five OCS Liaison Staff Members

Organization ^a	Isolated ^b	Connected ^c
Canada Command	18.2% (6.1%)	81.8% (2.1%)
CBSA	13.3% (6.1%)	86.7% (3.1%)
CSIS	20.0% (12.1%)	80.0% (3.8%)
DFAIT	50.0% (6.1%)	50.0% (0.5%)
DND/CF	17.2% (15.2%)	82.8% (5.6%)
Federal - Other	25.0% (6.1%)	75.0% (1.4%)
HC	10.0% (3.0%)	90.0% (2.1%)
PCO	10.0% (3.0%)	90.0% (2.1%)
PCO S&I	25.0% (3.0%)	75.0% (0.7%)
PHAC	4.5% (3.0%)	95.5% (4.9%)
Province of B.C.	5.6% (3.0%)	94.4% (4.0%)
PS	10.5% (6.1%)	89.5% (4.0%)
RCMP	9.1% (9.1%)	90.9% (7.1%)
TBS	25.0% (6.1%)	75.0% (1.4%)
Transport	11.1% (3.0%)	88.9% (1.9%)
U.S. Embassy	100.0% (9.1%)	0.0% (0.0%)
Total	7.2%	92.8%

Note. Figures in parentheses represent column percentages.

^a Only those organizations are included from which nodes are isolated.

^b n=33 of 458

^c n=425 of 458

The value of the OCS as a coordinating body can be further demonstrated by the degree of fragmentation that occurs when the five liaison staff members are removed from the network. While the degree of fragmentation is not as prevalent when the analysis is limited to the network of 73 study

participants, it still involves, most significantly, all four Treasury Board participants. It would appear the OCS was the primary link to these individuals (Figure 4). An individual from the RCMP who was identified as being somewhat peripheral in the analysis of network actors is also shown to be isolated following the removal of the OCS, including a member of Indian and Northern Affairs Canada, and a person from the National Exercise Division at Public Safety (shown as isolated triangles in the uppermost left of Figure 4).

The fragmentation is much more significant when the analysis is expanded to include the complete network of 458 nodes. Granted, this result may be due, in part or whole, to sampling limitations. Had more persons been contacted to provide their list of key contacts, it is possible, even likely, that some to many would have identified individuals— besides those within the OCS – with whom they shared information; in which case, the level of fragmentation following the removal of the OCS would be less. Moreover, had the OCS not existed, one can also argue that connections between individuals and organizations would have developed in any case, out of necessity. Yet, the results in Table 6 still paint an interesting picture that speaks to the unique and vital role the OCS is thought to have played.

Table 6 shows the 33 individuals by organization that are subsequently disconnected from the network following removal of the five OCS staff members, which represented 7.2% of the network. Only those organizations are included in the Table from which one or more members are isolated. There are several findings. Most notable, is the fact that the OCS were the only individuals in the network who identified key contacts within the U.S. Embassy, Public Works and Government Services Canada (PWGSC), and Natural Resources Canada (NRCan). This network indicates that they were also a main conduit to the NSA in PCO. Also, without the OCS, it appears that non-traditional partners (e.g., Citizenship and Immigration Canada (CIC), NRCan) may have been largely isolated from the broader community of security partners¹⁴. Another finding involves the role of the TBS, which no longer appears isolated in the larger network; no doubt, a result of its members having identified key contacts within other organizations. However, it is still important to realize that none of the other study participants who were affiliated with organization other than the OCS identified key contacts within TBS for purposes of information sharing. It would appear that TBS was able to reach out to certain others to obtain the information they sought, but the findings suggest that the OCS were the key intermediaries between TBS and the officials from the other organizations.

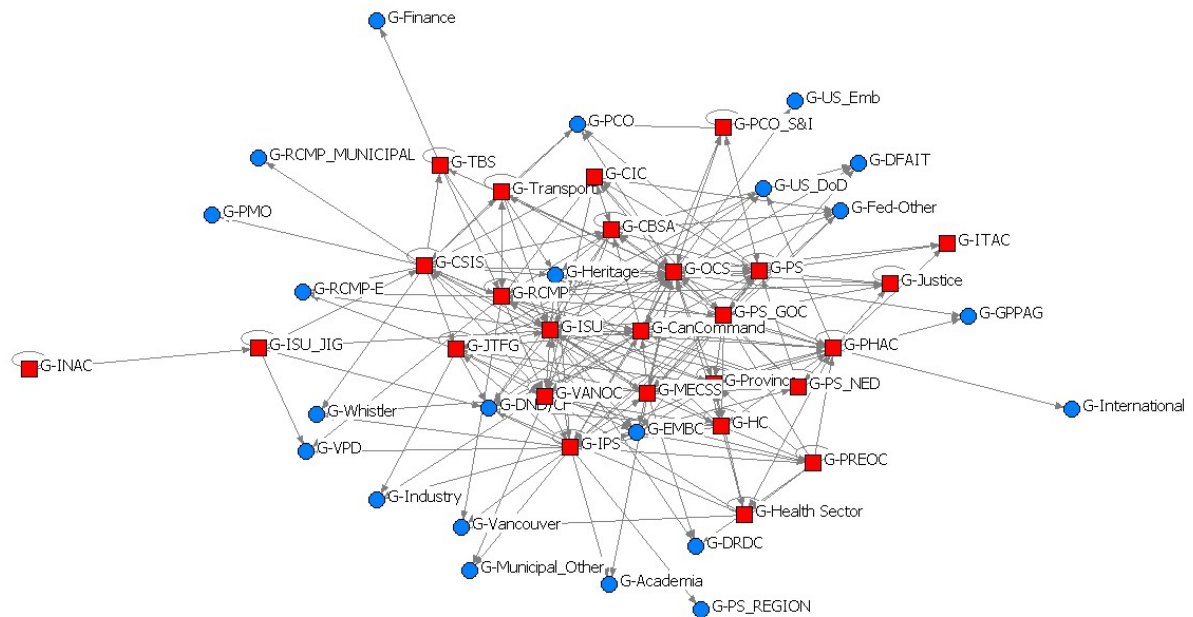
4. Key Information Sharing Relationships by Organization

The previous section provided an analysis of work relations between mostly senior government officials involved in safety and security planning and operations for the Olympics. Being that these individuals are nested within organizations, a separate analysis can be undertaken that looks at key information sharing relationships between the organizational entities associated with each individual. Figure 5 contains a network diagram of 48 organizational entities which were derived after collapsing the 458 individual actors based on their organizational, in some cases, sub-organizational affiliation. The nodes in Figure 5 are also differentiated based on whether the individuals affiliated with each were study participants (shown as red squares) or were merely nominated by those in the study (shown as blue circles). Of the organizations shown, individuals within 54.2% (n=26) participated in the SNA; whereas, 45.8% (N=22) are organizations whose employees were identified as key contacts.

¹⁴ These organizations are captured as part of “Federal – Other” in Table 1.

Decisions about which entities to highlight were to a certain degree made based on the number of individuals within each entity¹⁵. While the need to protect anonymity was of foremost concern, it was believed advantageous to highlight sub-entities, where possible. A balance needed to be achieved. Insisting on too high a level of aggregation was thought to limit analytical insight, whereas, creating too many sub-groupings was thought to add confusion. Thus, for purposes of the analysis, sub-entities within Privy Council Office, Public Safety and DND/CF were identified (i.e. PCO S&I, Government Operations Centre, National Exercise Division, and Joint Task Force Games, respectively).

Phase two of the study was undertaken to try and capture the social network information from those individuals who were identified two or more times by the interviewees in Phase One. It was thought to be a necessary step to augment the data with hitherto missing information on key individuals. When the decision was made about who to include in the Phase two sample, an inter-organizational affiliation network, similar to Figure 5, had not yet been completed. While there is little doubt that the complete sample of study participants contains many, if not, most of the key senior-level *individuals* who were involved in Olympic security planning and operations, what Figure 5 reveals is a rationale for including other individuals from organizations (blue circles) that now appear underrepresented.

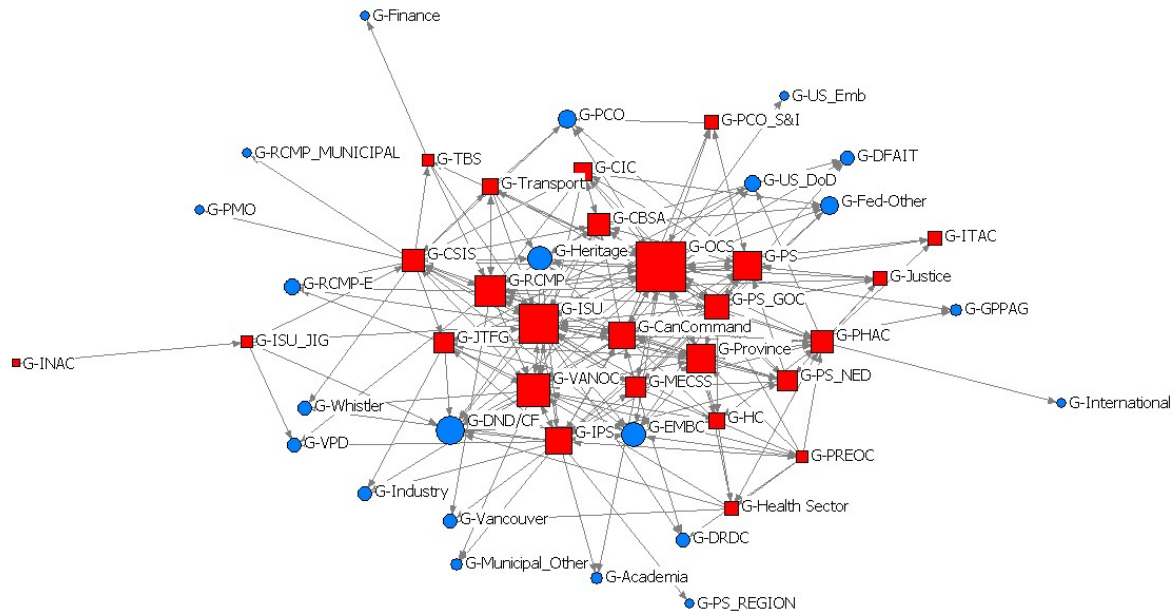


*Figure 5: V2010 Olympic Security Planning and Operations
Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organizational Entity*

Note. N=48 (26 nodes, shown as red squares, represent organizations with whom study participants (Phases 1 and 2) are affiliated; 22 nodes, shown as blue circles, represent the organizational affiliation of individuals who were nominated as key contacts but who were not interviewed or contacted to complete an electronic survey).

¹⁵ Sub-entities with fewer than two individuals were aggregated and presented as part of a larger grouping.

That rationale is most apparent when reviewing a revised network diagram in Figure 6 in which the size of the nodes are shown to vary by Indegree, the number of times persons within the respective organizations were cited by others as key contacts. It may be that the involvement of any one individual within organizations, such as DND/CF, not including Canada Command or Joint Task Force Games, which are shown as a separate nodes, was not as prevalent as some others, but when captured together, their involvement as organizations can be viewed to be much more significant.

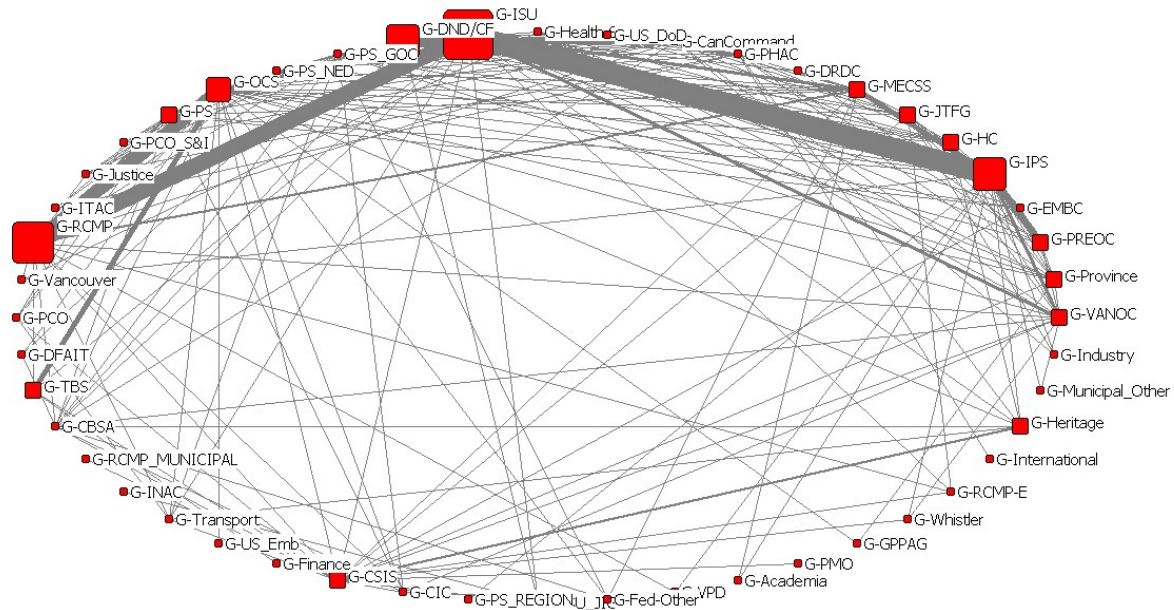


*Figure 6: V2010 Olympic Security Planning and Operations
Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organizational Entity and Size by Indegree*

Note. N=48

Centrality measures can be calculated for the organizational network in a manner similar to that undertaken with the person-to-person relations in the previous section (see Annex F). The OCS ranked first by far in terms of their number of incoming connections, which is apparent given the size of their node in Figure 6. The ISU ranked second, followed by VANOC, the RCMP (not including E-Division, which is captured separately and ranked 12th out of 15), the Province and Public Safety (not including the Government Operations Centre or National Exercise Division, which ranked 8th and 10th out of 15, respectively). While this analysis has focused on the relative standing of organizations based on their number of incoming ties, it is worth noting that the IPS and PHAC ranked somewhat higher in terms of their number of outgoing than incoming connections. In interviews, a representative from PHAC spoke candidly about the need to continually make others aware of the important implications of security related matters for public health. It would appear the IPS might have faced a similar situation relating to public safety and consequence management. That said, one cannot ignore the fact that both the IPS and PHAC ranked within the top ten in terms of outgoing and incoming connections. Both developed strong links to other organizations and appear to have played key roles.

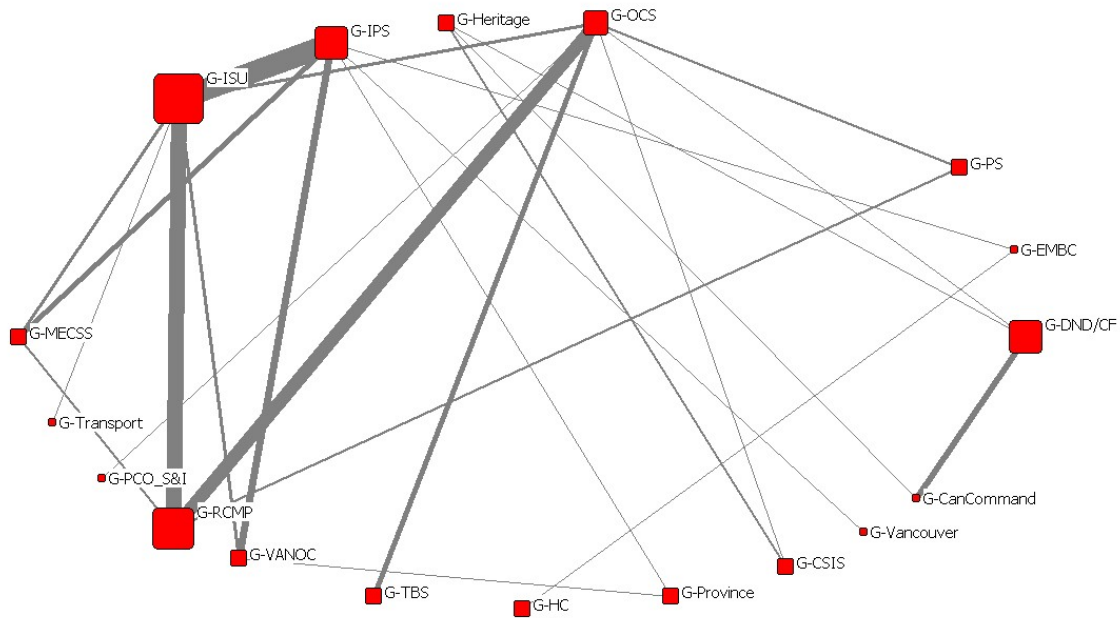
When the 458 nodes and 954 person-to-person links were collapsed by organization, the links between multiple individuals from different organizations were summed. Whereas before, a one or zero was used to indicate the presence or absence of a link between any two individuals, in the collapsed network by organizational affiliation, links are weighted based on the number of individuals within each organization who referred to one another as key contacts for purposes of sharing information. The higher the value of the link between organizations, the greater the number of individuals within one that referred to those within the other as key contacts. Thus, weighting the links provides another means of assessing the strength of the information sharing relationship that existed between organizations during Olympic planning and operations, as shown in Figure 7.



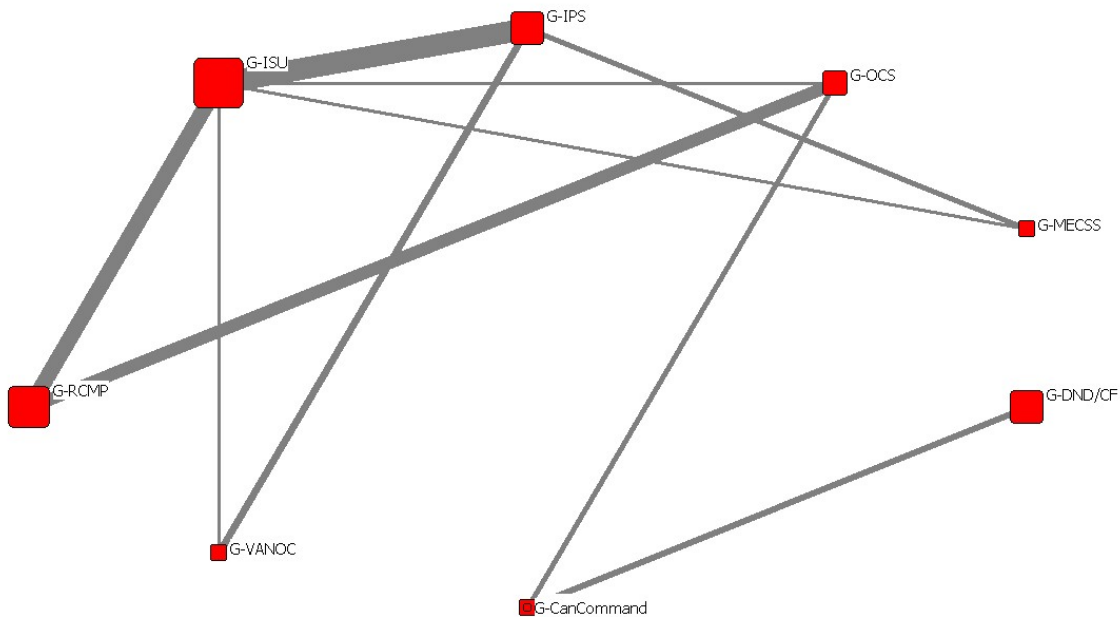
*Figure 7: V2010 Olympic Security Planning and Operations
Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organizational Entity, Size by Indegree, and
Links Weighted Based on the Strength of the Interaction*

Note. N=48 organizational entities.

There are 254 ties (weighted by Indegree) between the 48 organizations in Figure 7. It is difficult to discern patterns without reducing the number of visible links. Since the organizations were nominated as having key contacts by an average (median) of four other organizations, the ties that were weighted four and below, as well as seven and below, were removed from the diagrams in Figure 8. Doing so permits the reader's attention to be directed at those inter-organizational relationships that had the greatest interaction (i.e. in the upper half and fourth quartiles, respectively) during V2010 planning and operations.



Note. N=22. Weighted links are shown where the value is five and above (upper half quartile).



Note. N=10. Weighted links are shown where the value is eight and above (upper fourth quartile).

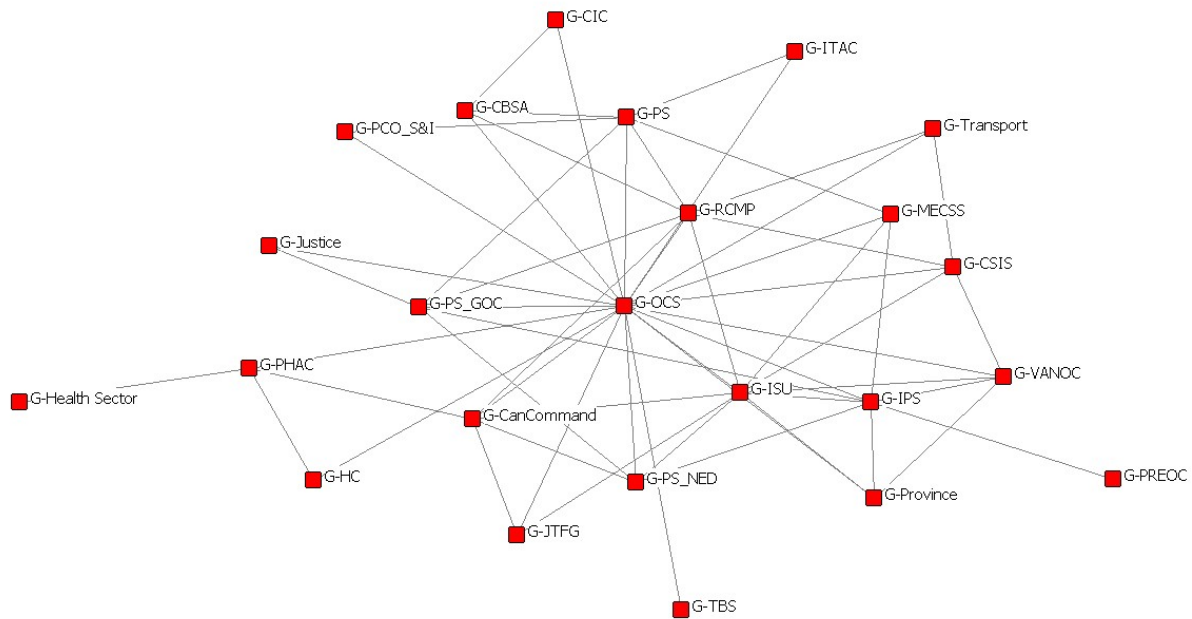
*Figure 8: V2010 Olympic Security Planning and Operations
Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organizational Entity, Size by Indegree, and
only those Links Showing Relationships in the Upper Half and Fourth Quartiles*

Relationships having the most direct interaction were first and foremost, between the ISU and IPS, then the ISU with RCMP headquarters, followed by RCMP headquarters with the OCS. Unlike prior analyses that focused on the directionality of the ties, having weighted ties between organizational entities obscures the direction of interactions. For example, one might infer from the diagram that the ISU and IPS had a much stronger relationship, overall, based on the two-way exchange of information, than that between most other organizations. While the analysis reveals 24 connections between the IPS and ISU, there were only eight between the ISU and IPS. The fact the IPS was co-located with the ISU no doubt contributed to the fact that persons in the IPS identified a significant number of people in the ISU as key contacts. But persons in the ISU similarly identified only one-third as many people in the IPS. How one interprets the weighted inter-organizational ties must take into account the fact that heavier lines merely denote a greater degree of interaction between the persons in different organizations. Little if anything can be inferred about the quality of the interactions that exist or whether information sharing was mutual. For instance, persons in one organization may feel that strengthening ties with another organization is somewhat to very important. It by no means implies that persons in the other organization will feel similarly. Moreover, heavier links imply higher levels of interaction between the individuals within different organizational entities for purposes of sharing information. Having a relatively higher number of people involved in Olympic security planning and operations creates the possibility for certain inter-organizational relationships to stand out as compared to some others.

A more rigorous approach to understanding the connections that existed between organizations involves an analysis of “cliques”. The definition of a “clique” involves “the maximum number of actors who have all possible ties present among themselves” (Hanneman, 2007). Since most algorithms that study sub-structures require binary, symmetric data, the organization-by-organization matrix, shown in Figure 6, was first symmetrized by only showing those ties that are reciprocated (e.g. ties only exist if XY and YX are both present). Whereas before, the total number of entities in the network was 48, insisting that any two organizations were identified as a key contact for purposes of information sharing by persons in both organizations, reduces the nodes to 24 (see Figure 9). The density of the corresponding matrix is greatly reduced as a result of this requirement. The OCS also figures prominently in this revised network as a key boundary spanner, at the centre of the diagram, having maintained reciprocal information sharing relationships with 21 of the 24 entities. Further inspection reveals that the Health Sector was only connected in this network through PHAC. Likewise, the PREOC only developed and maintained a reciprocated connection through the IPS, and Treasury Board was only connected via the mutual sharing of information with members of the OCS.

Undertaking an analysis of “cliques” reveals 19 “maximal complete sub-graphs” based on the requirement that all possible ties be present among the entities which make up the clique (see Table 7). Remarkably, the OCS was a member of all 19 cliques. The ISU was a member of eight cliques (42.1%), whereas, the next most involved organization was PS (not including the Government Operations Centre (GOC) or National Exercise Division (NED)), which was involved in five of the 19 cliques (26.3%). Looking at how many cliques the different organizations shared membership in (see Actor-by-Actor Clique Co-Membership Matrix in Annex G), one can see that the OCS and ISU were the most closest connected organizations on the basis of them sharing membership in eight of the 19 cliques (42.1%). Despite IPS staff being co-located with the ISU, for example, the two organizations shared membership in only 3 cliques (15.8%), which is the most the ISU had in common with any public safety organization. The IPS also shared membership with OCS in four cliques (21.1%), which suggests that the IPS interacted more closely with the OCS than any other safety or security organization or even the federal and regional offices of Public Safety (the IPS shared two cliques with the PS GOC and one with the PS NED). The OCS was also the only

organization to share a clique with Health Canada and PHAC. There were also no overlaps between the ISU and the GOC.



*Figure 9: V2010 Olympic Security Planning and Operations
Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organizational Entity, Symmetrized with Reciprocated Ties*

Note. N=24. Based on reciprocity-symmetric data.

Looking at a hierarchical clustering of cliques based on the extent to which they overlap with one another (i.e. have the most number of members in common), one can see that the OCS and ISU had the closest working relationship, followed by the OCS, ISU and Canada Command, then the OCS, ISU, Canada Command and the IPS. Somewhat separate from these cliques were close relationships between the RCMP and PS, followed by RCMP, PS and CSIS.

Table 7: Clique Analysis by Organization

1: Province, OCS, IPS, ISU, VANOC	11: PS, OCS, RCMP, PS_GOC
2: MECSS, OCS, IPS, ISU	12: PS, OCS, RCMP, CBSA
3: OCS, IPS, ISU, PS_NED	13: PS, OCS, ITAC
4: CanCommand, OCS, JTFG, ISU	14: PS, MECSS, OCS
5: CanCommand, OCS, ISU, RCMP	15: PS, OCS, PCO_S&I
6: CanCommand, OCS, ISU, PS_NED	16: OCS, CSIS, Transport, RCMP
7: OCS, ISU, CSIS, RCMP	17: OCS, IPS, PS_GOC, PS_NED
8: OCS, ISU, CSIS, VANOC	18: OCS, PS_GOC, Justice
9: CanCommand, PHAC, OCS	19: OCS, CBSA, CIC
10: HC, PHAC, OCS	

Note. 19 cliques between organizational entities (i.e. maximal complete sub graphs) were identified.

5. Safety versus Security

While there was tremendous emphasis placed on preventing or mitigating threats to the security of the Olympics, equally important was the ability of all levels of government to manage the response and recovery had a significant consequence management crisis occurred. Even though this research study was initiated to examine the “whole of government” approach to security planning and operations for the Games, during the interviews, it became apparent that public safety and security were inextricably linked. As one senior official argued, making the decision to shoot down a plane could neutralize a threat to security, but it could create a consequence management crisis. Several of the interviewees, particularly those from public safety organizations, expressed concern that too little attention was paid to consequence management vis-à-vis the overwhelming emphasis on Olympic security. Some were even more candid, having suggested that the two pillars: safety and security, were actually “silos”, in so far as there was very little crossover during Olympic planning and operations. The extent to which there was a disconnect between safety and security was explored in the main report. This section will draw on the available SNA data that illuminate issues between safety and security

*Table 8: Frequency Distribution of the Complete Social Network (N=458)
by Function: Safety, Security, the Games or Other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Security	CanCommand	11	4.6	2.4	2.4
	CBSA	15	6.3	3.3	5.7
	CIC	3	1.3	0.7	6.3
	CSIS	20	8.4	4.4	10.7
	DND/CF	29	12.2	6.3	17.0
	DRDC	4	1.7	0.9	17.9
	ISU	40	16.8	8.7	26.6
	ISU_JIG	5	2.1	1.1	27.7
	ITAC	2	0.8	0.4	28.2
	JTFG	12	5	2.6	30.8
	MECSS	11	4.6	2.4	33.2
	OCS	10	4.2	2.2	35.4
	PCO	10	4.2	2.2	37.6
	PCO_S&I	4	1.7	0.9	38.4
	RCMP-E	4	1.7	0.9	39.3
	RCMP	33	13.9	7.2	46.5
	RCMP_MUNICIPAL	2	0.8	0.4	46.9
	Transport	9	3.8	2.0	48.9
	US_DoD	11	4.6	2.4	51.3
	VPD	3	1.3	0.7	52.0
	Total	238	100.0	52.0	
Safety	EMBC	5	4.8	1.1	53.1
	HC	10	9.6	2.2	55.2
	Health Sector	14	13.5	3.1	58.3
	INAC	4	3.8	0.9	59.2
	International	1	1	0.2	59.4
	IPS	10	9.6	2.2	61.6
	PHAC	22	21.2	4.8	66.4
	PREOC	5	4.8	1.1	67.5

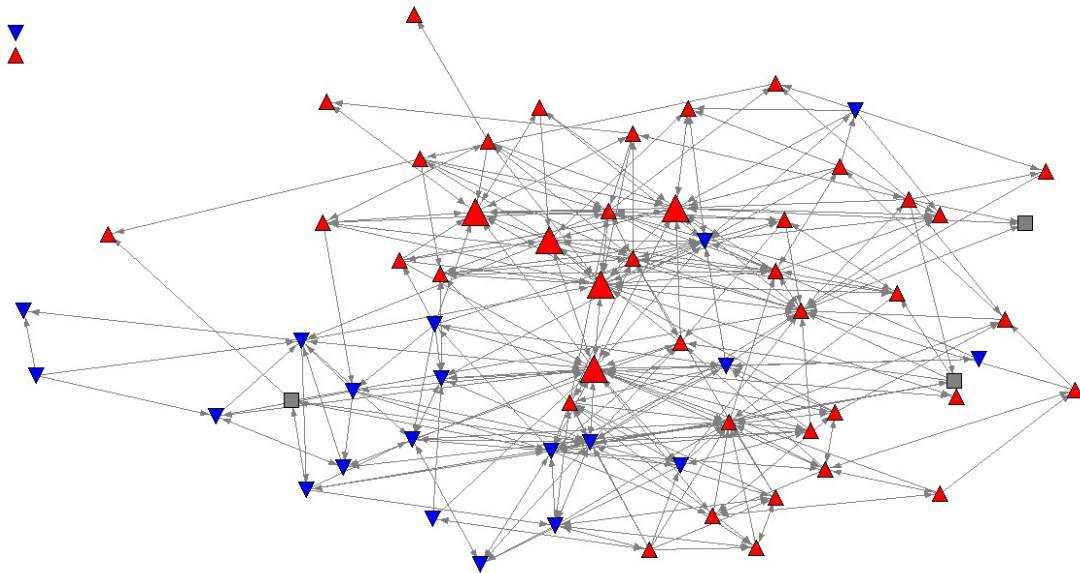
		Frequency	Percent	Valid Percent	Cumulative Percent
Safety, <i>cont'd.</i>	Province	3	2.9	0.7	68.1
	PS	19	18.3	4.1	72.3
	PS_GOC	5	4.8	1.1	73.4
	PS_NED	3	2.9	0.7	74.0
	PS_REGION	2	1.9	0.4	74.5
	Vancouver	1	1	0.2	74.7
	Total	104	100.0	22.7	
Games	Heritage	13	36.1	2.8	77.5
	Province	1	2.8	0.2	77.7
	VANOC	22	61.1	4.8	82.5
	Total	36	100.0	7.9	
Other	Academia	2	2.5	0.4	83.0
	DFAIT	4	5	0.9	83.8
	Fed-Other	8	10	1.7	85.6
	Finance	3	3.8	0.7	86.2
	GPPAG	2	2.5	0.4	86.7
	Industry	6	7.5	1.3	88.0
	Justice	12	15	2.6	90.6
	Municipal_Other	4	5	0.9	91.5
	PMO	2	2.5	0.4	91.9
	Province	14	17.5	3.1	95.0
	TBS	8	10	1.7	96.7
	U.S. Embassy	3	3.8	0.7	97.4
	Vancouver	7	8.8	1.5	98.9
	Whistler	5	6.3	1.1	100.0
	Total	80	100.0	17.5	
Total		458	100.0	100.0	100.0

Table 8 shows the distribution of interviewees by functional type. Actors were classified based on what was perceived to be their orientation, whether it was primarily related to “security”, “public safety”, the “Games” or “Other”¹⁶. Based on the purpose of the study, it is not surprising that the majority of interviewees were primarily focused on security (52%), as compared to public safety (22.7%) or the Games (7.9%). An “Other” category was also created to capture those persons whose orientation could not be determined or was not perceived to be predominantly related to any one of the above three categories. Nearly one in five people were believed to fall into this category (17.5%), and virtually all of the individuals (82.3%) from the Province. While few to many of these individuals were likely oriented towards either safety or security or both, they were difficult to classify.

Whereas the above table includes all 458 nodes, Figure 10 contains a network diagram showing the lines of affiliation based on key information sharing relationships for a subset of 66 out the 73 study

¹⁶ Being that the issues related to safety and security first arose during the interviewees, prior consideration had not been given to having interviewees and survey respondents’ self-identity as having been primarily oriented towards either security, safety or the Games. Records were subsequently categorized as such based on knowledge of a person’s title, organization and sub-organizational affiliations during the Games (e.g., ISU). As such, an “other” category was used to capture those persons whose orientation was unclear or different.

participants by functional type¹⁷. Those actors who were primarily oriented towards security are highlighted in red (up triangles); whereas, those involved in safety are shown in blue (down triangles), and those who were primarily affiliated with the Games are shown in grey (squares). There are also five red (up triangles), which are larger than the rest, which represent the five key members of the OCS. As was previously the case, two actors are disconnected from the network of interviewees. Of the remaining 64 nodes residing within the main component, one can clearly observe a tight clustering among a large segment of security nodes (shown in the middle to upper left), as well as a separate clustering of security-related nodes in the bottom right. There also appear to be key intermediaries who served to broker connections within and between the safety and security segments. Judging by the placement of the OCS nodes, they would appear central within the security segment, but one OCS node, in particular, was vital in bridging together the security and safety communities. There are other nodes as well, albeit only few, representing safety and security communities that acted as important intermediaries linking the communities together. Two of the blue nodes that appear embedded deep in “security” territory were officials within PS, as were the two that appeared at the margins of both clusters, at the top and on the right.

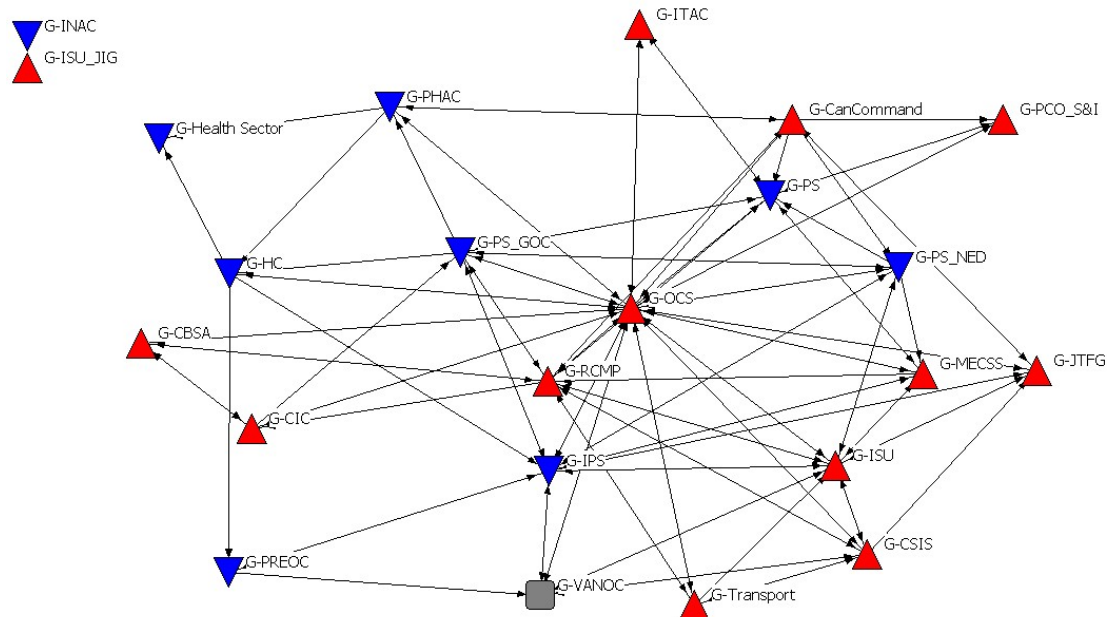


*Figure 10: V2010 Olympic Security Planning and Operations
Partial Affiliation Network Based on Key Information Sharing Relationships
Among those Persons who were Interviewed as Part of the AER Study
Based on Functional Classification (i.e. Safety, Security, Games)*

Note. N=66. Those actors primarily oriented towards security are shown in red (up triangles). Those involved in safety are shown in blue (down triangles), and those oriented towards the Games are shown in grey (squares).

¹⁷ Being that the functional classification for the remaining eight study participants was “other”, they are not shown as part of the network diagram. These eight individuals represented the following organizational entities: GPPAG (1), Justice (2), Province (1), and TBS (4).

Collapsing the individual nodes in Figure 11 by “organization” reveals yet another way of examining the relations between actors by organization and functional classification (i.e. safety, security, games). From a visual inspection of the organization-to-organization network in Figure 11, one can see that the OCS figures prominently in the graph, as does RCMP headquarters. Most of the remaining security organizations cluster on the right-hand-side; whereas, two (CBSA, CIC) are mostly separated on the left-hand-side. Most of the “safety” organizations cluster in the upper left, whereas, PS and the NED are more highly associated with DND/CF (i.e. Canada Command and JTFG), as well as MECSS. Certainly for the NED, their relationship to security partners had to do with their involvement in the Exercises even if their orientation tended to be mostly related to safety concerns.



*Figure 11: V2010 Olympic Security Planning and Operations
Partial Affiliation Network Based on Key Information Sharing Relationships
Between Actors by Organization and Functional Classification (i.e. Safety, Security, Games)*

Note. N=23. Those actors primarily oriented towards security are shown in red (up triangles). Those involved in safety are shown in blue (down triangles), and those oriented towards the Games are shown in grey (squares).

6. The Role of a Coordinating Body

The social network findings are illustrative of a number of important findings. Key among them is the value of having a coordinating body, such as the OCS, when undertaking security preparations for an event, such as the Olympics, which as one senior official remarked, posed significant challenges given its size, the length of time, the number of departments, and Federal-Provincial and international connections.

By all accounts, security planning and operations for the Olympics were widely viewed by interviewees as being successful. There may not have been a significant security event, such as an

earthquake or terrorist attack, but officials faced numerous challenges nonetheless, and were prepared. As the secretariat responsible for coordinating security, the OCS appears to have accomplished precisely what was needed for a “whole of government” activity, the sheer scale and complexity of which, was unlike anything that Canada had dealt with before. Interviewees widely attested to the crucial role played by the OCS, to which the SNA findings can attest. The OCS ranked the highest in terms of their overall centrality in the network. It had the most connections to other organizational entities and sub-entities, was connected to other entities which were also quite central in the network. By facilitating, negotiating, mediating, and advocating, its members also became key intermediaries or “boundary spanners”, operating at the nexus between a number of organizational entities. They provided the vital bridge to the regular Deputy Minister Committees, including the DM SAC, as well as several other Committees and Working Groups, the Province, and Treasury Board.

Despite the fact the OCS was highly embedded in the network and according to many, instrumental to the task of security planning and operations, the decision to create a separate secretariat for security was not readily apparent. Rather, examples were provided, early on, where some organizations viewed the Olympics as simply a routine event, and their involvement as merely an extension of their everyday responsibilities. In fact, a significant driver for establishing the OCS, according to one official, was because things were not moving quickly enough, and that coordination just was not getting done. According to one senior official, there was “...the realization that there really wasn’t anybody in charge federally, on the security side...”.

After reviewing the findings from the SNA, one can readily see the benefits to horizontality within the federal government where there are structures in place to coordinate “whole of government” activities. Following the Olympics, there appears to be greater appreciation and acceptance regarding the need for horizontal approaches to planning within the federal government. One senior official believes that the public sector is already much more “horizontal” around specific initiatives than the private sector. Even so, according to him, the exercises (e.g. Bronze, Silver and Gold), in particular, created the impetus for much greater horizontality between departments and agencies. It begs the question of whether the degree of interconnectedness in the network denotes a shift towards greater cooperation and collaboration in the public sector to address problems associated with an increasingly complex social and political landscape. The extent to which a coordinating body is necessary and useful for facilitating horizontality on a day-to-day basis warrants scrutiny in another context.

7. Conclusion

The social network study provided unique opportunities to examine the structure of information sharing relationships between, mostly, senior leaders, federally, who were involved in security planning and operations for the Olympics. Arranging security for the Olympics was a mammoth undertaking that was highly complex involving hundreds of public sector individuals, upwards of 30 federal departments and agencies and Federal-Provincial and international connections. While a certain degree of horizontality already exists within the government, particularly as it involves specific initiatives, this marked the first time that a separate secretariat was established within the Privy Council Office, operating with much discretion and authority, to coordinate security preparations for a major international event. Having a federal coordinating body that complemented the role of the RCMP, had credibility, legitimacy and a locus of authority – being managed by Deputy Minister level Coordinator, and housed within a central agency, was widely viewed by security partners, also many public safety officials, as being critically important to security preparations.

Members of the OCS were identified as being key information sharing contacts by a greater number of individuals than most everyone else in the network of study participants. Whereas most others would need several referrals in order to reach most of the others in the network, the OCS could reach the vast majority of partners directly or using, at most, one referral. For them, it came down to personal relationships, having a large “rolodex” and how they got along with people. They were “skilled intermediaries”, serving to link together persons from different organizations, and ensuring the involvement of non-traditional partners. They also provided a “unified front” when negotiating with Treasury Board for security funding. They also developed a strategic perspective and understanding of security capabilities and shortfalls.

Some, albeit only very few, of those involved in safety and security preparations believed that interpersonal relationships were all but irrelevant to successful interagency efforts. Though, most held the contrary view. The cultivation of interpersonal ties, between traditional and non-traditional security partners, as well as safety and security communities, in particular, were widely viewed as being instrumental to planning efforts. While formal interagency structures and processes existed, personal relationships facilitated interagency partners’ ability to derive an understanding of the problem space, including what needed to be done, by whom and the best means of addressing tasks.

Clearly, not everyone occupied the same roles in Olympic security planning and operations. Not everyone were central players, for example. Some (e.g. scientists, non-traditional partners) were effective transmitters of information to those who needed it. Others were effective intermediaries serving to link together otherwise disparate communities. A select few were expert brokers. They were highly central and due to them having tentacles that spread throughout the interagency community, were highly effective conduits for sharing security-related information and for bringing people to together to address security challenges. Very few were “information sinks”, since those who couldn’t get along or were reluctant brokers had been replaced and disappeared from the network.

By all accounts, planning for the Olympics represented a significant departure from that required for past events. Normally, a separate secretariat to coordinate “whole of government” activities would not be needed. While the Olympics were clearly unusual, it may be difficult to assess the circumstances under which a separate coordinating body will be needed for future “whole of government” initiatives. However, the analyses in this paper point to significant benefits to interagency coordination, cooperation and collaboration, where an overarching entity such as the OCS exists.

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8. Annex A



Government of Canada
Privy Council Office

Coordinator for the
2010 Olympics and G8 Security
Ottawa, Canada
K1A 0A5

Gouvernement du Canada
Bureau du Conseil privé

Coordonnateur de la sécurité pour
les Olympiques de 2010 et du G8

June 8, 2010

Sir or Madam,

1. As Coordinator for the 2010 Olympic and G8 Security I have requested the assistance of the Defence Research and Development Canada Centre for Security Science to lead the whole-of-government post-2010 Winter Games lessons learned process. By September, we expect to have a final After Event Report with appropriate recommendations for future major events. Part of the study involves an interagency network analysis which is looking at communications and information sharing patterns at the organizational level.

2. As someone who played a key role during 2010 Winter Games planning and operations, you have been selected to participate in this study. In a few days time, you will be invited to respond to a short, on-line questionnaire. I felt it important to let you know, in advance, that you will be contacted.

3. By learning more about your experiences, how security-related information was shared and decisions were made, we can look at ways to improve inter-agency coordination and collaboration on public security and

Le 8 juin 2010

Madame, Monsieur,

1. À titre de coordonnateur de la sécurité des Olympiques de 2010 et du G8, j'ai demandé l'aide du Centre des sciences pour la sécurité de Recherche et développement pour la défense Canada pour ce qui est de la direction du processus pangouvernemental lié à la mise à profit des leçons retenues concernant les Jeux olympiques d'hiver de 2010. D'ici septembre, nous devrions posséder un rapport final après événement qui renfermera des recommandations pertinentes en vue de futurs événements d'importance. L'étude compte entre autres une analyse de réseaux interorganisations portant sur les modèles de communication et d'échange d'information au niveau organisationnel.

2. Comme vous avez joué un rôle essentiel au cours de la planification et des opérations relatives aux Jeux olympiques d'hiver de 2010, vous avez été choisis pour prendre part à l'étude mentionnée ci-dessus. Dans quelques jours, vous serez invités à répondre à un bref questionnaire en ligne. J'ai pensé qu'il était important de vous en informer d'avance.

3. En tirant des enseignements de vos expériences et en déterminant comment l'information relative à la sécurité a été échangée et comment les décisions ont été prises, nous pourrions envisager des façons d'améliorer la coordination et la

Canada

safety planning and operations for future major international events.

collaboration interorganisations à l'égard de la planification et des activités liées à la sécurité publique lors de futurs événements internationaux d'importance.

4. By September, we expect to have a final After Event Report with lessons for future major event planning. If you have any questions or comments about this study, you are welcome to contact Susan McIntyre, Team Lead at 613-995-8008 or susan.mcintyre@drdc-rddc.gc.ca.

4. D'ici septembre, un rapport final après événement devrait être prêt et faire état des leçons à retenir en ce qui a trait à la planification de futurs événements d'envergure. Si vous avez des questions à poser ou des observations à faire au sujet de la présente étude, veuillez communiquer avec Susan McIntyre, chef d'équipe, au 613-995-8008 ou à susan.mcintyre@drdc-rddc.gc.ca.

5. Thank you for your time and consideration. I sincerely hope that you will participate by completing the online survey.

5. Merci de votre attention. Je compte sur votre participation au sondage en ligne.

Yours sincerely,

Veuillez recevoir, Madame, Monsieur, mes sincères salutations.

Le coordonnateur de la sécurité des Olympiques de 2010 et du G8,



Coordinator for the 2010 Olympic and G8 Security

9. Annex B

Subject/Sujet : After Event Report Study : l'étude après événement

1. In a follow-up to Mr. Elcock's recent letter, I am writing to request your participation in an on-line survey in support of the whole-of-government post-2010 Winter Games lessons learned process.
2. As part of the After Event Report study, we are conducting an important study, which identifies key information sharing and decision-making relationships. Information relationships can be strong indicators of interagency collaboration and in the case of decision-making, can reveal important constraints. Results will provide the basis for recommendations on ways to strengthen public safety and security planning and operations for future major international events.
3. It is important for you to know that all answers will be held in strict confidence. Only the research team will have access to the data and answers will only be released as summaries in which no individual will be identified.
4. To access the survey, please go to the following URL:

[Hyperlink – inserted here]

The survey should take no more than 20 minutes. We need your input to ensure the results are valid and meaningful.

5. If you have any questions or comments about this study, you are welcome to contact me at 613-995-8008 or susan.mcintyre@drdc-rddc.gc.ca.
6. Please complete the survey at your earliest convenience. Thank you for helping us with this important study.

1. Pour faire suite la lettre que M. Elcock vous a envoyée récemment, nous vous prions de participer un sondage en ligne pour appuyer le processus pangouvernemental de mise profit des leçons retenues des Jeux olympiques d'hiver de 2010.

2. Dans le cadre de l'étude après événement, nous effectuons une analyse des réseaux afin de déterminer les flux de la communication et de la prise de décision. Cette méthode peut identifier les réseaux clés, les points de décision et les grappes isolées. Elle fournira des données réelles pour justifier les observations subjectives.

3. Il est important que vous sachiez que toutes les réponses resteront strictement confidentielles. Seule l'équipe de recherche aura accès aux données, et les réponses ne seront publiées que sous forme de résumés dans lesquels aucune personne ne sera identifiée.

4. Pour avoir accès au sondage, allez l'adresse URL suivante

[Hyperlink – inserted here]

Le sondage sur les réseaux ne devrait pas prendre plus de 20 minutes. Il est suivi de quelques questions facultatives, auxquelles vous êtes invité(e) à répondre si vous désirez fournir d'autres renseignements.

5. Si vous avez des questions ou des commentaires au sujet de l'étude, vous pouvez communiquer avec moi au 613 995-8008 ou susan.mcintyre@drdc-rddc.gc.ca.

6. Votre participation à cette étude est essentielle à la validité de l'analyse et des recommandations finales concernant la planification et les activités pangouvernementales liées à la sécurité. Je vous remercie de votre temps et de votre contribution.

Susan G. McIntyre
Knowledge Management/Gestion du savoir Centre for Security
Science/Centre des sciences pour la sécurité Défense R&D Canada/R&D
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10. Annex C

2010 Winter Games After Event Study

Study Purpose

The Office of the Coordinator for the 2010 Olympics and G8 Security in the Privy Council Office was mandated to coordinate a "whole-of-government" approach for the security of the Vancouver 2010 Olympic and Paralympics Winter Games. As you know, significant interagency cooperation was needed to plan and operate the Games. As a community of security partners in the Government of Canada, we now face a significant opportunity for learning and organizational improvement. By capturing and transferring your knowledge and experience, the results of this study will be used to ensure more efficient and effective government planning and operations for major events in the future.

Your Participation

You have been identified as a key player in 2010 Olympic public security and safety planning and operations. Your perspective and input are essential to the analysis of lessons arising from the whole-of-government experience.

Time Commitment

We estimate the interview will take about 60 minutes to complete. Thank you very much for your time!

Confidentiality

- The information reported in this process will be held in strict confidence and used for purposes of analysis only.
- Results that identify you by name will be kept within the team administering this study.
- All names will be replaced with pseudonyms or published in aggregate form to help protect your anonymity.

Survey Contact

Defence R&D Canada Centre for Security Science was asked to lead the lessons learned process and produce an After Event Report (AER). The report will be given to the Privy Council Office for review and implementation of recommendations, as required.

If you have questions or concerns about the nature of this study, please contact Susan McIntyre, After Event Report Lead at 613-944-8162 or susan.mcintyre@drdc-rddc.gc.ca. For questions about any of the contents of the interview guide, please call or email: Sean Norton, Research Scientist at 613-944-8190 or sean.norton@drdc-rddc.gc.ca.

Name of person being interviewed	Title
Position during the Olympics	E-mail

Interview Questions

Please reflect on the strategic and operational experience that you gained from your involvement in planning and operations for the V2010 Olympics when answering the following questions.

1. From a whole of government perspective, what did you learn about planning and operations for major events?
2. Do you have any particular suggestions or observations pertaining to federal whole-of-government major event planning and operations in the following areas:
 - (a) Governance?
 - (b) Inter-agency relationships?
 - (c) Sensitive information sharing?
 - (d) Assessment and protection of national, provincial and regional critical infrastructure?
3. How do existing federal government mandates enable or hinder the whole-of-government public safety and security approach for major events?
4. Can you describe an example of learning or innovation that occurred within your organization as a result of inter-agency involvement in planning and operations for the Games?
5. How will your organization make use of what it has learned for future, major inter-agency events?

Organizational Network Questions

Your answers to the following questions are vital in order that we might find ways to improve interagency communication and collaboration on safety and security-related matters for major events. Social Network Analysis will be used to analyze the information flows and decision making linkages. Names will not be published; they are only being collected to verify positions within a network. If you would be interested in a diagram and short analysis of your position within the social network after the study is completed, please advise the research team.

6. Who were the key people with whom you shared information on V2010 planning and operations? These people can come from within and outside your organization.

Name of Department/Agency	(a) Name of Person AND/OR (b) Position during the Olympics
1. _____	(a) _____ (b) _____
2. _____	(a) _____ (b) _____
3. _____	(a) _____ (b) _____
4. _____	(a) _____ (b) _____
5. _____	(a) _____ (b) _____
6. _____	(a) _____ (b) _____
7. _____	(a) _____ (b) _____
8. _____	(a) _____ (b) _____
9. _____	(a) _____ (b) _____
10. _____	(a) _____ (b) _____
11. _____	(a) _____ (b) _____
12. _____	(a) _____ (b) _____
13. _____	(a) _____ (b) _____
14. _____	(a) _____ (b) _____
15. _____	(a) _____ (b) _____

7. Who were the key people to whom you turned to help you make informed decisions concerning V2010 planning and operations?

Name of Department/Agency	(a) Name of Person AND/OR (b) Position during the Olympics
1. _____	(a) _____ (b) _____
2. _____	(a) _____ (b) _____
3. _____	(a) _____ (b) _____
4. _____	(a) _____ (b) _____
5. _____	(a) _____ (b) _____
6. _____	(a) _____ (b) _____
7. _____	(a) _____ (b) _____
8. _____	(a) _____ (b) _____
9. _____	(a) _____ (b) _____
10. _____	(a) _____ (b) _____
11. _____	(a) _____ (b) _____
12. _____	(a) _____ (b) _____
13. _____	(a) _____ (b) _____
14. _____	(a) _____ (b) _____
15. _____	(a) _____ (b) _____

The following question deals with a complex, interagency environment, where people are often dependent on other people, within and outside their own organization, to make decisions in order that they can do their job.

- 8. Who was responsible for making decisions so that you could do your job during V2010 planning and operations? These people can come from within and outside your organization.**

Name of Department/Agency	(a) Name of Person AND/OR (b) Position during the Olympics
1. _____	(a) _____ (b) _____
2. _____	(a) _____ (b) _____
3. _____	(a) _____ (b) _____
4. _____	(a) _____ (b) _____
5. _____	(a) _____ (b) _____
6. _____	(a) _____ (b) _____
7. _____	(a) _____ (b) _____
8. _____	(a) _____ (b) _____
9. _____	(a) _____ (b) _____
10. _____	(a) _____ (b) _____

- 9. To which people, positions or organizations would you want to have greater access in order to be even more effective at major event planning and operations in the future?**

Name of Department/Agency	(a) Name of Person AND/OR (b) Position during the Olympics
1. _____	(a) _____ (b) _____
2. _____	(a) _____ (b) _____
3. _____	(a) _____ (b) _____
4. _____	(a) _____ (b) _____
5. _____	(a) _____ (b) _____

5/5

11. Annex D

2010 Winter Games After Event Organizational Network Study

Study Purpose

The Office of the Coordinator for the 2010 Olympics and G8 Security in the Privy Council Office was mandated to coordinate a “whole-of-government” approach for the security of the Vancouver 2010 Olympic and Paralympics Winter Games. As you know, significant interagency cooperation was needed to plan and operate the Games. As a community of security partners in the Government of Canada, we now face a significant opportunity for learning and organizational improvement. By capturing and transferring your knowledge and experience, the results of this study will be used to ensure more efficient and effective government planning and operations for major events in the future.

Your Participation

You have been identified as a key player in 2010 Olympic public security and safety planning and operations. Your perspective and input are essential to the analysis of lessons arising from the whole-of-government experience.

Time Commitment

We estimate the survey will take about 20 minutes to complete. Thank you very much for your time!

Confidentiality

- The information reported in this process will be held in strict confidence and used for purposes of analysis only.
- Results that identify you by name will be kept within the team administering this study.
- All names will be replaced with pseudonyms or published in aggregate form to help protect your anonymity.

Survey Contact

Defence R&D Canada Centre for Security Science was asked to lead the lessons learned process and produce an After Event Report (AER). The report will be given to the Privy Council Office for review and implementation of recommendations, as required.

If you have questions or concerns about the nature of this study, please contact Susan McIntyre, After Event Report Lead at 613-944-8162 or susan.mcintyre@drdc-rddc.gc.ca. For questions about the survey questions, please call or email: Sean Norton, Research Scientist at 613-944-8190 or norton.sg@forces.gc.ca.

Footnote:

Director General Military Personnel Research and Analysis authorizes the administration of this survey within
DND/CF in accordance with CANFORGEN 198/08 CMP 084/08 271214Z Oct 08.
Authorization number 859/10

"The opinions expressed in this document are those of the author and are not necessarily those of the
Department of National Defence or the Canadian Forces"

Questions:

1. For whom did you work, as of the last day of the Olympics, February 28, 2010?
Provincial employees should specify the Ministry and specific organization or Crown corporation.

Canada Border Services Agency (CBSA)
Canadian Food Inspection Agency (CFIA)
Canadian Heritage
Canadian Nuclear Safety Commission (CNSC)
Canadian Security Intelligence Service (CSIS)
Citizenship and Immigration Canada (CIC)
Defence R&D Canada (DRDC)
Department of Finance
Department of Foreign Affairs and International Trade (DFAIT)
Department of National Defence and the Canadian Forces (DND/CF)
Emergency Management BC (EMBC)
Environment Canada (EC)
Finance Canada
Justice Canada
Indian and Northern Affairs
Integrated Threat Assessment Centre (ITAC)
Fisheries and Oceans Canada
Health Canada (HC)
National Research Council Canada (NRC)
Privy Council Office (PCO)
Public Health Agency of Canada (PHAC)
Public Safety Canada (PS)
Royal Canadian Mounted Police (RCMP)
Transport Canada (TC)
Treasury Board Secretariat (TBS)
Vancouver Police Department (VPD)
Other, *specify* _____

2. What was your position, as of the last day of the Olympics on February 28, 2010?

3. Please specify if you were a member of any one of the following organizations or entities, as of February 28, 2010?
Mark all the apply

ADM Emergency Management Committee (ADM EMC)
Canada Command
Deputy Minister Security Advisory Committee (DMSAC)
Integrated Security Unit (ISU)
Integrated Public Safety (IPS)
Government Partners Public Affairs Group (GPPAG)
Joint Task Force Games (JTFG)
Joint Intelligence Group (JIG)
Major Events Coordinated Security Solutions (MECSS)
Office of the Coordinator for Olympic Security (OCS)
Vancouver Organizing Committee (VANOC)
Not applicable

4. Please specify if you were a member of an operations centre during V2010 planning or operations.

Air Command Centre (ACC)
Air Support Olympic Coordination Centre (ASOCC)
Games Joint Operations Centre (GJOC)
Government Operations Centre (GOC)
Integrated Command Centre (ICC)
National Operations Centre (NOC)
Olympic Marine Operations Centre (OMOC)
Provincial Regional Emergency Operations Centre (PREOC)
Provincial Emergency Coordination Centre (PECC)
Vancouver Area Command Centre (VACC)
Whistler Area Command Centre (WACC)
Other, please specify _____
Not applicable

5. Were you a member of any other organization, not previously listed, that was specifically created for V2010 planning or operations?

No
Yes, please specify _____

Your answers to the following questions essential in helping to find ways to improve interagency communication and collaboration on safety and security-related matters for major events

Social Network Analysis will be used to analyze the information flows and decision making linkages.

Names will not be published; they are only being collected to verify positions within a network.

6. Who were the key people with whom you shared information on V2010 planning and operations?

This question involves your informal network of “key contacts” – the people you would meet, call or email on a fairly regular basis to share work-related information. These people can come from within and outside your organization.

Response categories:

First and Last Name of Person, along with:

(a) Department/Agency; and/or (b) V2010 Organization (e.g. RCMP, ISU, OCS)

7. Who were the key people to whom you turned to help you make informed decisions concerning V2010 planning and operations?

This question involves your network of “trusted advisors” – the people you would look to for advice or work-related information to help you make decisions. These people can come from within and outside your organization.

Response categories:

First and Last Name of Person, along with:

(a) Department/Agency; and/or (b) V2010 Organization (e.g. RCMP, ISU, OCS)

8. Who did you look to make decisions in order that you could do your job during V2010 planning and operations?

People often depend on other people, within and outside their own organization, to make decisions in order that they can do their job. This question involves those people (e.g. in your management chain, but also others within and outside your organization) who needed to make planning and/or operational decisions so that you could move forward.

Response categories:

First and Last Name of Person, along with:

(a) Department/Agency; and/or (b) V2010 Organization (e.g. RCMP, ISU, OCS)

9. To which people, positions or organizations would you want to have greater access in order to be even more effective at major event planning and operations in the future?

Response categories:

a) Dichotomous Category: Person, Position or Organization

b) Fields (based on above selection): First and Last Name; Position; Name of Organization

**Thank you for taking the time to complete this organizational network study.
Your contribution is very important to us!**

Comments

We welcome any other comments or feedback that you might have based on the strategic and operational experience that you gained from your involvement in planning and operations for the V2010 Olympics. [An open-ended field to permit comments]

Thank you again for your time!

12. Annex E

*Table 9: Measures of Degree, Closeness and Betweenness Centrality
for the 73 Respondents to the SNA Survey by Organization*

No	Organization	Degree Centrality				Closeness Centrality				Betweenness Centrality	
		Outdegree		Indegree		InFarness		OutFarness		Freeman Node	
		Rank ¹	Value ²	Rank	Value	Rank ³	Value	Rank	Value	Rank	Value
39	IPS	1	53	8	11	13	591	9	448	8	304
70	OCS	2	46	1	26	2	553	2	414	1	1663
57	OCS	3	26	9	10	7	576	3	432	2	514
60	CSIS	4	24	17	2	16	599	NA	5256	53	0
2	CanCommand	5	23	15	4	25	612	16	458	29	43
54	CBSA	5	23	16	3	45	655	28	477	25	76
34	HC	6	22	13	6	17	601	15	457	13	173
29	CSIS	7	21	17	2	30	618	22	470	15	135
8	PREOC	8	20	17	2	40	642	34	487	40	25
9	PHAC	8	20	15	4	22	609	21	469	45	10
20	ISU	8	20	14	5	41	643	32	485	51	2
23	OCS	8	20	4	15	5	568	5	443	5	445
26	ISU	8	20	16	3	24	611	12	452	49	5
27	IPS	8	20	13	6	39	639	24	472	26	75
32	PS_GOC	8	20	15	4	21	607	16	458	22	85
50	MECSS	8	20	12	7	21	607	4	439	14	163
71	IPS	8	20	14	5	21	607	13	453	37	32
56	OCS	9	19	7	12	7	576	38	495	7	312
16	Health Sector	10	18	17	2	14	594	NA	5256	53	0
10	MECSS	11	17	17	2	49	698	29	479	42	16
13	OCS	11	17	3	17	4	562	6	444	3	513
72	MECSS	11	17	15	4	42	645	28	477	39	27
22	RCMP	12	16	14	5	22	609	28	477	33	36
41	PS_NED	12	16	12	7	20	606	7	445	28	49
18	ISU	13	15	15	4	22	609	24	472	34	35
33	RCMP	13	15	9	10	15	596	19	466	10	214
40	PHAC	13	15	15	4	24	611	27	476	41	20
42	RCMP	13	15	11	8	23	610	21	469	17	122
14	JTFG	14	14	14	5	21	607	20	468	30	43
49	Justice	14	14	15	4	25	612	19	466	21	88
58	JTFG	14	14	15	4	33	625	43	509	38	31
3	PS	15	13	17	2	40	642	39	497	53	0
4	JTFG	15	13	13	6	17	601	36	493	16	132
28	IPS	15	13	13	6	31	620	26	475	38	31
51	Justice	15	13	19	0	NA	5256	1	398	53	0

52	IPS	15	13	5	14	10	585	5	443	6	399
53	PS_GOC	15	13	17	2	26	613	12	452	39	27
37	PS	16	12	6	13	8	581	8	447	9	256
46	ISU	16	12	2	20	3	557	22	470	4	475
24	CSIS	17	11	17	2	38	636	48	562	53	0
36	ISU	17	11	4	15	9	584	14	455	11	194
59	OCS	17	11	16	3	35	629	11	450	43	14
11	VANOC	18	10	17	2	44	652	33	486	36	33
45	RCMP	18	10	10	9	6	573	18	465	12	189
47	Province	18	10	13	6	14	594	30	480	20	92
7	CanCommand	19	9	17	2	46	664	21	469	47	7
15	PREOC	19	9	14	5	38	636	37	494	50	4
19	CIC	19	9	15	4	32	623	25	473	24	77
44	Transport	19	9	17	2	36	631	30	480	18	114
68	PHAC	19	9	19	0	NA	5256	10	449	53	0
67	RCMP	20	8	13	6	15	596	46	537	50	4
17	CSIS	21	7	16	3	30	618	31	481	31	38
21	CanCommand	21	7	17	2	36	631	30	480	30	39
31	VANOC	21	7	17	2	37	634	33	486	42	16
55	Transport	21	7	16	3	42	645	47	539	32	37
25	TBS	22	6	17	2	30	618	39	497	51	2
38	PS_GOC	22	6	10	9	12	589	14	455	23	84
43	PCO_S&I	22	6	14	5	27	614	35	489	47	7
69	RCMP	22	6	11	8	11	588	31	481	27	69
30	TBS	23	5	15	4	28	615	42	504	48	6
1	TBS	24	4	17	2	32	623	49	564	51	2
5	ITAC	25	4	17	2	34	627	29	479	35	34
6	INAC	25	4	19	0	NA	5256	NA	5256	53	0
62	PS_NED	25	4	17	2	29	617	21	469	52	1
66	ISU_JIG	25	4	19	0	NA	5256	NA	5256	53	0
12	JTFG	26	3	17	2	46	664	44	511	44	11
35	Transport	26	3	17	2	48	673	45	529	46	8
61	TBS	26	3	14	5	27	614	40	498	24	77
63	ISU	26	3	12	7	18	604	17	462	19	101
65	PS	26	3	17	2	47	668	23	471	41	20
73	VANOC	27	2	16	3	19	605	41	502	53	0
48	RCMP	28	1	17	2	1	530	NA	5256	53	0
64	CBSA	28	1	18	1	43	649	NA	5256	53	0

Note. Since the information network is directed, separate statistics have been computed for incoming and outgoing ties and farness. Farness statistics can be expressed as closeness, being the reciprocal of farness.

¹Actors are rank ordered based on Outdegree followed by Indegree. The greater the number of connections to other actors in the network, the higher the actor's rank in terms of their centrality score.

²Outdegree is calculated based on the number of outgoing ties in relation to the complete network, N=341

³Actors are rank ordered by degree of closeness vis-à-vis all other actors in the network. Since closeness is the reciprocal of farness, the lower the farness value the shorter (closer) the geodesic distance to all other nodes.

13. Annex F

Table 10: Measures of Degree, Closeness and Betweenness Centrality by Organizational Entity

Organizational Entity	Degree Centrality		Closeness Centrality		Betweenness Centrality	
	Rank ¹	Value	Rank	Value ²	Rank	Value
G-OCS	1	26	1	53	1	221.4
G-IPS	2	19	2	62	2	134.4
G-CSIS	3	14	4	66	3	86.0
G-DND/CF	3	14	4	66	4	79.8
G-ISU	3	14	3	65	10	29.1
G-RCMP	3	14	7	69	5	60.7
G-VANOC	4	13	5	67	8	38.0
G-Heritage	5	12	10	72	6	59.5
G-CBSA	6	11	8	70	11	23.4
G-JTTFG	6	11	8	70	9	30.9
G-PS	6	11	6	69	12	16.1
G-Health	7	9	10	72	14	12.5
G-Province	7	9	9	71	15	8.9
G-DRDC	8	7	11	74	13	12.9
G-CIC	9	6	15	82	18	3.1
G-EMBC	9	6	12	75	26	0.8
G-PS_GOC	9	6	14	79	17	3.4
G-Transport	9	6	13	78	16	5.2
G-Justice	10	5	17	85	25	1.2
G-ISU_JIG	11	4	23	91	7	43.1
G-PCO	11	4	18	86	23	1.6
G-PCO_S&I	11	4	16	84	20	2.0
G-PHAC	11	4	19	87	24	1.6
G-PS_NED	11	4	14	79	21	1.9
G-Vancouver	11	4	19	87	19	2.4
G-Fed-Other	12	3	21	89	na	0.0
G-Industry	12	3	20	88	na	0.0
G-RCMP-E	12	3	24	95	na	0.0
G-Whistler	12	3	22	90	na	0.0
G-TBS	13	2	20	88	na	0.0
G-Academia	14	2	24	95	na	0.0
G-DFAIT	14	2	22	90	na	0.0
G-Municipal_Other	14	2	24	95	na	0.0
G-US_DoD	14	2	25	98	na	0.0
G-VPD	14	2	27	103	22	1.8
G-INAC	15	1	30	129	na	0.0
G-PMO	15	1	29	110	na	0.0
G-PS_REGION	15	1	26	100	na	0.0
G-RCMP_MUNICIPAL	15	1	28	104	na	0.0
G-US_Emb	15	1	23	91	na	0.0

Note. Although the organizational network was derived from the known affiliation of all 341 actors who were identified as part of the social network study, only 40 actors were interviewed to nominate their key information sharing relationships. Even though the organizational network is directed, the directional ties are based on the

information solely derived from the 40 interviewees. Thus, calculating separate for information sending and receiving for the complete organizational network was deemed to be inappropriate in so far as it would falsely characterize interagency relations based on information gleaned from only 40 individuals. A decision was made to symmetrize the organizational network as a result, which means for the purposes of this analysis, information sharing links are deemed to be reciprocal.

¹Actors are rank ordered based on the number of connections to other actors. The greater the number of connections to other actors in the network, the higher the actor's rank in terms of their centrality score.

²Actors are rank ordered by degree of closeness vis-à-vis all other actors in the network. Since closeness is the reciprocal of farness, the lower the farness value the shorter (closer) the geodesic distance to all other nodes.

14. **Annex G**

Table 11: Actor-by-Actor Clique Co-Membership Matrix by Organizational Entity

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	G-Can Command	G- CBSA	G- CIC	G- CSIS	G-HC	G-Health Sector	G-IPS	G-ISU	G- ITAC	G- JTFG	G- Justice	G- MECSS	G- OCS	G-PCO_ S&I	G- PHAC	G- PREOC	G- Province	G-PS	G-PS_ GOC	G-PS_ NED	G- RCMP	G-TBS	G- Transport	G- VANOC
G- CanCommand	4	0	0	0	0	0	0	3	0	1	0	0	4	0	1	0	0	0	0	1	1	0	0	0
G-CBSA	0	2	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0	0
G-CIC	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
G-CSIS	0	0	0	3	0	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	2	0	1	1
G-HC	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
G-Health Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-IPS	0	0	0	0	0	0	4	3	0	0	0	1	4	0	0	0	1	0	1	2	0	0	0	1
G-ISU	3	0	0	2	0	0	3	8	0	1	0	1	8	0	0	0	1	0	0	2	2	0	0	2
G-ITAC	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
G-JTFG	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
G-Justice	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0
G-MECSS	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	0	0	1	0	0	0	0	0	0
G-OCS	4	2	1	3	1	0	4	8	1	1	1	2	19	1	2	0	1	5	3	3	5	0	1	2
G-PCO S&I	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
G-PHAC	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0
G-PREOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-Province	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
G-PS	0	1	0	0	0	0	0	0	1	0	0	1	5	1	0	0	0	5	1	0	2	0	0	0
G-PS_GOC	0	0	0	0	0	0	1	0	0	0	1	0	3	0	0	0	0	1	3	1	1	0	0	0
G-PS_NED	1	0	0	0	0	0	2	2	0	0	0	0	3	0	0	0	0	0	1	3	0	0	0	0
G-RCMP	1	1	0	2	0	0	0	2	0	0	0	0	5	0	0	0	0	2	1	0	5	0	1	0
G-TBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G-Transport	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0
G-VANOC	0	0	0	1	0	0	1	2	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	2

15. List of Acronyms

ADM EMC	Assistant Deputy Ministers' Emergency Management Committee
AER	After Event Report
BC	British Columbia
CANSOFCOM	Canada Special Operations Forces Command
CBRNE	Chemical Biological Radiological/Nuclear Explosives
CBSA	Canada Border Services Agency
CF	Canadian Forces
CIC	Citizenship and Immigration Canada
CRMf	Capability Risk Management Framework
CRTI	CBRNE Research and Technology Initiative
CSIS	Canadian Security Intelligence Service
DFAIT	Department of Foreign Affairs and International Trade
DFO	Department of Fisheries and Oceans
DHS	Department of Homeland Security
DM SAC	Deputy Ministers' Security Advisory Committee
DM WG	Deputy Ministers' Working Group on 2010 Olympic Security
DND	Department of National Defence
DND/CF	Department of National Defence and the Canadian Forces
DRDC	Defence Research & Development Canada
EC	Environment Canada
EMBC	Emergency Management British Columbia
GOC	Government Operations Centre
GPPAG	Government Partners Public Affairs Group
HC	Health Canada
INAC	Indian and Northern Affairs Canada
IOC	International Olympic Committee
IPS	Integrated Public Safety
ISU	Integrated Security Unit
ITAC	Integrated Threat Assessment Centre
JIG	Joint Intelligence Group
JTFG	Joint Task Force Games

MECSS	DRDC Major Events Coordinated Security Solutions
NED	National Exercise Division (PS)
NORTHCOM	U.S. Northern Command
NRC	National Research Council
NRCan	Natural Resources Canada
NSA	National Security Adviser
OCS	Office of the Coordinator for 2010 Olympics and G8 Security
PCH	Heritage Canada
PCO	Privy Council Office
PHAC	Public Health Agency of Canada
PMO	Prime Minister's Office
PREOC	Provincial Regional Emergency Operations Centre
PS	Public Safety Canada
PWGSC	Public Works and Government Services Canada
RCMP	Royal Canadian Mounted Police
SME	Subject Matter Expert
SNA	Social Network Analysis
TBS	Treasury Board Secretariat
TC	Transport Canada
UBC	University of British Columbia
U.S.	United States of America
USCG	United States Coast Guard
V2010	Vancouver 2010 Olympic and Paralympic Winter Games
VANOC	Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games
VFPA	Vancouver Fraser Port Authority
VPD	Vancouver Police Department

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13. ABSTRACT

Ensuring adequate security for a major event, such as the Olympics and Paralympics Games, is a significant, multi-year effort involving numerous federal, provincial, regional and municipal government partners, as well as a vast web of public, private and international stakeholders. The current study was undertaken to provide a Social Network Analysis of the flow of information (between interagency partners) on security-related issues prior to and during the Olympic Games. A chief goal of those mostly senior level officials involved in Olympic security planning was to acquire and convey information in order that sound decisions could be made. By measuring the structure of formal and informal relationships between interagency partners (e.g., who shared information with whom), this study assessed how well the leadership group was effectively collaborating to make decisions. Findings indicated prevalent attitudes favouring interpersonal, even inter-organizational, working relationships among the mostly senior-level officials involved. That is not to say that everyone occupied similar roles in the network with respect to information sharing, however. This paper introduces a typology of nodes based on the roles some officials were thought to exhibit (e.g., transmitters, information sinks, expert brokers, and periphery). Examples include those who were on the receiving end of information, but neglected to utilize personal relationships to pass along the information they received. Others were faced with the need to continually make partners aware of the important role they had to play. Whilst others still were key brokers of information and intermediaries who linked communities together. This paper also conveys the benefits to greater horizontality within the federal government where there are coordinating bodies, such as the Office of the Coordinator for the 2010 Olympic and G8 Security.

Résumé

Veiller à la sécurité d'un événement majeur comme les Jeux olympiques et paralympiques est une tâche colossale répartie sur plusieurs années qui nécessite la participation de nombreux partenaires des gouvernements fédéral, provinciaux, régionaux et municipaux ainsi qu'un vaste réseau d'intervenants à l'échelle publique, privée et internationale. La présente étude a été entreprise dans le but d'analyser les réseaux sociaux par lesquels l'information a circulé (entre les partenaires des divers organismes) avant et pendant les Jeux olympiques. L'un des principaux objectifs des fonctionnaires affectés à la planification de la sécurité des Jeux, qui appartenaient majoritairement aux échelons supérieurs, était d'obtenir et de transmettre l'information pour favoriser la prise de décisions éclairées. En observant la structure des relations formelles et informelles entre les partenaires des divers organismes (p. ex. qui partageait de l'information avec qui), l'étude a permis d'évaluer dans quelle mesure le groupe dirigeant collaborait dans le cadre du processus décisionnel. Selon les constatations de l'étude, il existe une tendance privilégiant les relations de travail interpersonnelles et même interorganisationnelles entre les fonctionnaires concernés. On n'en conclut toutefois pas que tous jouent des rôles similaires au sein du réseau de partage de l'information.

Le présent document fait état d'une typologie des nœuds d'information reposant sur les rôles que l'on pourrait associer à certains fonctionnaires (p. ex. transmetteur, collecteur d'information, expert du courtage d'information et acteur périphérique). On a notamment constaté que certains récepteurs d'information négligeaient d'utiliser leurs relations personnelles pour transmettre l'information reçue, tandis que d'autres devaient constamment rappeler aux partenaires l'importance de leur rôle. D'autres encore agissaient comme courtiers clés en matière de partage d'information et établissaient le lien entre les communautés. Enfin, cette étude démontre les avantages du renforcement de la communication horizontale au sein du gouvernement fédéral, surtout en présence d'organismes de coordination, comme le Bureau du coordonnateur de la sécurité (BCS) des Jeux olympiques de 2010 et du G8.

14. KEYWORDS, DESCRIPTORS or IDENTIFIERS (Technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)

Social network analysis; After Action Review; V2010; Olympics; Canada; Vancouver; Security; Safety; Senior officials; public sector; information sharing; interagency; interpersonal relationships; coordination